

Report To The
President And
The Congress



Activities Of The Energy Information Administration

Department of Energy

DLG-00487

By The
Professional
Audit Review
Team



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To the President of the United States,
the President of the Senate, and the
Speaker of the House of Representatives

This report describes the results of the Professional Audit Review Team (PART) evaluation of significant aspects of the energy data collection and analysis activities of the Department of Energy's Energy Information Administration (EIA). EIA was created pursuant to the Department of Energy Organization Act (Public Law 95-91 dated August 4, 1977). In accordance with the Act, PART's responsibility was transferred from reporting on the Federal Energy Administration's Office of Energy Information and Analysis to reporting on the Energy Information Administration.

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In accordance with the Act, PART consists of a Chairman designated by the Comptroller General and five members designated by the heads of the following Federal agencies: Bureau of Labor Statistics, Bureau of Census, Securities and Exchange Commission, Federal Trade Commission, and Council of Economic Advisers.

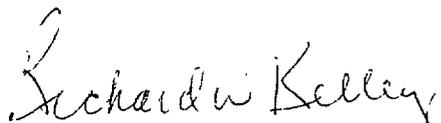
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This report describes the status of EIA's actions to (1) maintain its independence from the energy policy function, (2) determine the validity of energy data, (3) develop a National Energy Information System, and (4) improve the credibility of energy models. In commenting on a draft of the report the EIA Administrator said that the report was generally a fair assessment of EIA's activities during its first full year of existence and his comments on the major areas discussed in the report are contained in Appendix I.

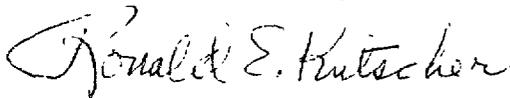
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Copies of this report are being sent to the Department of Energy, the Office of Management and Budget, the chairmen of energy-related congressional committees, and to the PART member agencies.



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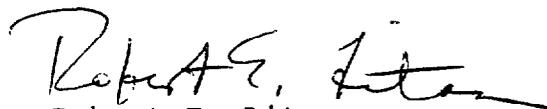
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EXECUTIVE SUMMARY

This report describes the results of an evaluation by the Professional Audit Review Team (PART) of the Energy Information Administration (EIA), Department of Energy. EIA was created by the Department of Energy Organization Act (Public Law 95-91 dated August 4, 1977) which consolidated the data collection and analysis activities formerly vested in the Federal Energy Administration, the Federal Power Commission, and the Bureau of Mines of the Department of Interior into one organization in the new Department of Energy.

In providing for the creation of EIA, the Congress emphasized the need for a separate organization capable of providing unbiased energy data and independent and objective analyses. Therefore, the Congress provided EIA with a measure of statutory independence by specifically stating that the Administrator of EIA need not obtain the approval of Department officials in connection with the collection, analysis, or publication of any reports prepared in accordance with the law. Further, the Congress provided that EIA be headed by a professionally qualified administrator who is appointed by the President and confirmed by the Senate. In so specifying, the Congress wanted to create an organization capable of providing the credible energy data and analysis needed for sound decisions on national energy policy.

PART was created pursuant to the Energy Conservation and Production Act (Public Law 94-385 dated August 14, 1976) to independently evaluate the data collection, analysis, and dissemination activities of the Federal Energy Administration's Office of Energy Information and Analysis. This office was merged into EIA when the Department of Energy was established on October 1, 1977, and, according to the Department of Energy Organization Act, is subject to an annual review by PART. The first PART report dated December 5, 1977, described actions needed to improve the credibility of energy data by (1) validating and verifying data, (2) separating the data programs from the energy policy function, and (3) documenting and testing computer models used for forecasting energy supply and demand. This report covers the period October 1977 through March 1979.

INDEPENDENT SOURCE OF ENERGY DATA AND ANALYSIS

PART found no reasons to question EIA's independence from the energy policy function. Upon creation of DOE, the responsibility for formulating and advocating national energy policy was separated from the energy data collection and applied analysis function, as originally mandated by the Energy Conservation and Production Act. This

continued separation of functions has strengthened EIA's position as an independent source of energy data and analysis. Further, EIA has been organized and administered in a manner designed to promote its credibility as a neutral source of energy data and energy analyses. Its organization consists of the following five operating groups.

1. Energy Data which is responsible for the collection and interpretation of data.
2. Energy Information Validation which is responsible for measuring and documenting the quality of energy information.
3. Applied Analysis which is responsible for making energy analyses and forecasts.
4. Energy Information Services which is responsible for publishing and distributing EIA publications and providing assistance to users of energy data.
5. Program Development which is responsible for developing high priority data systems.

The EIA operation most susceptible to political or policy influence is the Office of Applied Analysis which uses a set of predictive computer models to forecast and analyze the impact of energy policy alternatives on energy supplies, demand, costs, and prices. By adjusting certain input variables, alternative forecasts can be produced to evaluate a wide range of policy alternatives. The Office of Applied Analysis is responsible for making independent forecasts and analyses for the EIA Administrator's Annual Report as well as responding to requests of other DOE organizations, Federal and State organizations, congressional committees, industry, academia, and the general public for special forecasts and analyses.

Procedures have been established to record the assumptions each requestor external to EIA wants incorporated into particular forecasts and analyses and to assure that the resulting products are clearly described as having been prepared at a client's request. In addition, a public record is maintained of all requests for analytical services, the products furnished, and the assumptions the products were based on. In 1978, the results of approximately 40 Analysis Memoranda were published. These procedures apply to all requests from the Secretary of DOE, the DOE Office of Policy and Evaluation, and congressional committees.

PART's analysis of a representative sample of the resulting analytical products did not reveal any instances of policy influence.

This situation contrasts sharply with the findings of PART's audit of EIA's predecessor organization, the Federal Energy Administration's Office of Energy Information and Analysis. That organization, in effect, operated as an arm of the energy policy and planning staff of the Executive Office of the President.

EIA's products, unlike its predecessors, are more credible because EIA is operating in a manner designed to meet the intent of the Congress that it is independent of policy bias and designed to provide for widespread public acceptance and confidence in energy information activities.

One exception to this general finding of PART relates to EIA's role, or lack thereof, in providing analytical products to assist the Assistant Secretary for Policy and Evaluation and his staff. This is the DOE organization responsible for assisting the Secretary and others in formulating national energy policies. In accomplishing its work, the Policy and Evaluation Office uses computer model based analyses prepared by DOE and also performs analyses on computer models developed and operated by contractors. EIA is generally perceived to have an important role in providing analyses to DOE policymakers even though this is not always the case. Therefore, it is not always clear to what extent energy policy formulation is influenced by the analysis furnished by EIA and alternatively from these other sources. It also is unclear whether the Policy and Evaluation Office's use of other than EIA analytical products circumvents the congressional intent in establishing EIA as a neutral and credible source of analysis to assist energy policy makers in DOE, other Government agencies, the Congress, and the public.

The General Accounting Office, (GAO), in another review not directly related to the PART work, was advised by the Office of Policy and Evaluation officials, that contractors were employed because EIA could not respond to requests in a timely manner. GAO plans to look into this matter in the coming year. (See Chapter 2.)

YEAR OF TRANSITION HIGHLIGHTS—
NEED FOR IMPROVED PLANNING

EIA's first year of existence was a year of transition during which the data gathering, dissemination, and analysis units from three previously separate Federal agencies were consolidated into a new organization. Also during its first year, an Administrator, three Assistant Administrators and various office and branch chiefs were appointed. As

in agreement

might be expected, a consolidation and reorganization of this magnitude, involving approximately 700 personnel, was not accomplished without some disruption and "growing pains."

The problems associated with organizing EIA into a consolidated, efficient, and credible source of energy data and analyses were aggravated by a high rate of turnover among its senior level management officials. Since EIA's inception in October 1978, the Deputy Administrator, one Assistant Administrator, and two office directors left EIA. Some of these positions remained unfilled for many months. In addition, it is anticipated that Dr. Lincoln Moses, the EIA Administrator, will return to Stanford University in July or August 1980. In commenting on a draft of this report, the EIA Administrator acknowledged that some delays were experienced in filling senior management positions, but all key assistant administrators are now in place and the search for a new Deputy is progressing well.

PART believes the slow progress in improving certain areas--data validation, data dissemination, and improved computer model credibility--may be attributable to the lack of continuity of upper level management. Many problems could have been prevented or resolved in a shorter time-frame if EIA management had been more stable or if greater emphasis and priority had been given to the preparation of program plans for each of its organizational units.

A program plan was prepared in August 1978 for EIA's Office of Applied Analysis which delineated objectives for its various branches and established milestone dates for documenting, testing, and improving public access to its computer models. The PART believe that this plan is a significant step demonstrating that EIA is moving positively toward improved model credibility. However, the plan was the first prepared for any EIA organization and it was prepared 10 months after EIA was created. A program plan was prepared for the Office of Energy Information Services in December 1978 and for the Office of Energy Information Validation in February 1979. The Office of Energy Data's plan was started in March 1979. Much of the lack of progress and direction described below resulted from insufficient planning in the areas examined by the PART.

ACCURACY OF MOST ENERGY
DATA IS STILL UNDETERMINED

The credibility of energy data and the acceptance of national energy policies based on this data are dependent upon the collection, analysis, and reporting of accurate energy information. PART's first

report, dated December 5, 1977, addressed the validation and verification activities of the Office of Energy Information and Analysis, EIA's predecessor agency, and recommended corrective actions. PART's basic conclusion was that little attention had been paid to verifying the energy data collected, analyzed, and reported by the Office of Energy Information and Analysis, and other Federal energy collection organizations, and, as a result, the accuracy of most energy data is undetermined.

In commenting on a draft of that report, the Secretary of Energy generally agreed with PART and stated that EIA would (1) emphasize verifying the accuracy and validity of energy data; (2) make a firm commitment to provide the necessary resources to carry out this function; and (3) develop, as one of EIA's first tasks in this area, a detailed program plan which includes schedules and resources required to validate all energy data systems. However, over a year has passed since the Secretary made these comments, and, although EIA increased attention and resources to data validation activities, little progress has been made in the actual assessment of the accuracy and reliability of energy data.

EIA established an Office of Energy Information Validation and appointed an Assistant Administrator as its head. This office is responsible for developing procedures and methodologies needed to validate Federal energy information and systems and for conducting validation and verification reviews of such information and systems. The validation approach adopted was to contract with 3 different organizations to conduct pilot validation studies of 14 of the approximately 55 existing energy information systems involving 15 out of a total of 185 forms. Because validation officials were uncertain how data systems should be validated, each contractor was charged with developing an acceptable data validation methodology in the course of validating assigned energy information systems. However, the contractors had neither experience in the data validation area nor clear-cut direction from the Validation Office. As a result, managerial, planning, and directional problems plagued all the contractors.

As of February 1979, after many delays and serious mismanagement, one of the contracts was allowed to expire and a second contractor was instructed to closeout its work by June 1979 before final validation reports will be completed. A third contractor submitted draft reports on two of the systems it is responsible for validating and is continuing to work on the others. As these contracts were administered, validation officials became aware that these efforts were not going to adequately validate the systems. In fact, the Assistant Administrator for Energy Information Validation stated in a November 20, 1978, memo that none of the pilot efforts provided sufficient validation of the targeted energy

data system and that EIA intends to expand and refine such efforts in fiscal year 1979 to meet minimum standards.

The rationale that validation officials used for employing contractors was that the office lacked personnel resources to do the data validation work in-house. However, Validation Office personnel did gradually increase from 2, at the office's inception, to 27 professionals as of February 1979.

One of the reasons the contracts have proved to be generally inadequate from the standpoint of verifying and validating energy data systems is that their objectives were never clearly defined. This is attributable, in a large measure, to the fact that the goals and objectives of the Office of Energy Information Validation have never been clearly defined. What makes this situation even worse is that the Secretary of Energy, in commenting on a draft of PART's initial report, stated on November 7, 1977, that "...One of the first tasks in this area (data validation) will be to develop a detailed program plan which includes schedules and resources required to ensure the validation of all energy data systems...."

Well over a year elapsed before such a plan was developed in February 1979, and, although increased attention and resources have been applied to data validation, the basic conclusion of PART's first report, that the accuracy of most energy data is undetermined, remains unchanged. (See Chapter 3.)

LIMITED PROGRESS IN ESTABLISHING A NATIONAL ENERGY INFORMATION SYSTEM

EIA and its predecessor agency have had the responsibility of establishing a National Energy Information System since August 1976. The System was intended to be an authoritative source of adequate, accurate, comparable, coordinated, and credible energy information within the Government. Only limited progress has been made in developing the System in the nearly 2-1/2 years that have passed since the legislation setting forth the requirements of such a system was enacted. Two conceptual design and implementation plans were found by EIA to be inadequate and a third was under review by the Administrator as of March 1979. In the meantime, EIA has been collecting, cataloging, publishing, and disseminating a considerable volume of energy information. Although the PART did not attempt to evaluate the efficiency or effectiveness of EIA's clearinghouse or National Energy Information Center, we believe that these activities are worthwhile and will form the operational

nucleus of the National Energy Information System once it is implemented. PART believes that the December 1978 program plan prepared for the Office of Energy Information Services establishing objectives and scheduled accomplishments for the Office's publication and dissemination, information assistance, and outreach support functions will give a greater sense of direction to these operations. PART further believes that EIA is uncertain about what the legislation requires of them in operating and maintaining the National Energy Information System. This uncertainty contributed to the 2-1/2 year delay in establishing the System. We recommend that the Congress clarify what the System should contain so that EIA can design and implement a System that will satisfy it, the executive agencies, and the public. Such action could help prevent the incurrence of unnecessary costs by avoiding the development of a system that fails to meet congressional requirements. (See Chapter 4.)

EIA MOVING TOWARD IMPROVING THE CREDIBILITY OF ENERGY MODELS

The 1977 PART report suggested that EIA follow certain procedures and practices to ensure that mathematical and statistical models are used in a responsible controlled manner. These include (1) a system for obtaining the views of both experts and the general public, (2) established rules for changing the models, and (3) procedures to document, verify, validate, and test the models. PART still believes these procedures should be followed. PART also suggested that EIA establish a system for public access to its models.

EIA prepared a program plan for the Office of Applied Analysis which specifies, in a unified, comprehensive, and detailed fashion its mission, ongoing functions, and measureable objectives for fiscal years 1978 through 1981. Among the plan's projects are development of standards and procedures for documentation of analyses and models, development of standards and procedures for access to models and analyses, and development and implementation of a program for simplification and automation of model operating systems which would make models transferable to non-DOE users. EIA would also develop and monitor compliance with standards and procedures for technical review and oversight of applied analysis products, and each model would be documented. This plan is a major step in the right direction and in time it should improve the public credibility of EIA predictions and their usefulness to the Congress and the public.

This year, EIA has emphasized more complete documentation of their models and interim standards have been developed to ensure the uniformity of this documentation. All newly developed models will be documented as called for by the interim standards. EIA's goal is to have documentation satisfying the interim standards for all models used in the development

of forecasts and other analyses for the Administrator's 1978 Annual Report to the Congress. Model changes are made by the principal analysts responsible for the model. Changes are made either annually, on an as needed basis, or under a model development contract. There is no regular schedule or timetable for making model changes.

The Office of Analysis Oversight and Access under the Assistant Administrator of Applied Analysis is currently sponsoring model validation procedure development efforts for model assessment with the National Bureau of Standards, the Los Alamos Scientific Laboratory, and the Massachusetts Institute of Technology Energy Laboratory. Similar projects with the Brookhaven National Laboratory are under consideration. As a result of these pilot projects, standards, procedures, and guidelines for the verification, validation, and sensitivity testing of models will be developed. Preliminary standards, procedures and guidelines are scheduled for completion in 1979. Final ones are scheduled for completion in 1980.

Regarding access to models, EIA is following three courses of action:

- EIA staff will undertake studies utilizing models at the request of Congress and others.
- EIA is investigating the requirements for transmitting EIA models to the National Energy Software Center at the Argonne National Laboratory, which, if successful, will make EIA models generally available to the public.
- EIA, as part of model documentation, describes the structure and operation of models sufficient for a laymens' comprehension.

The PART believes the Applied Analysis Program Plan, the interim documentation standards, the validation procedure development efforts for model assessment, and EIA's procedures for access to models represent important and significant actions demonstrating that EIA intends to move positively toward improved credibility of energy analyses and projections. In the coming year, PART will continue to assess EIA's performance in these areas.

The Secretary of Energy, in his comments on the 1977 PART Annual Report, said that planning was underway to establish EIA advisory panels on (1) data systems design, (2) data validation, and (3) modeling. However, the Administration's efforts to reduce the number of advisory committees to Federal agencies has apparently prevented EIA from creating these advisory committees.

As a compromise, EIA worked with the American Statistical Association, to set up an Ad Hoc Committee on Energy Statistics to be utilized by EIA. PART is concerned about the ad hoc nature of this committee which connotes a special purpose, short duration committee which would not satisfy what PART perceives to be EIA's needs for a standing committee to provide ongoing technical advice. It is also unclear to what extent the ad hoc committee will represent the various interest groups as required by the Federal Energy Administration Act. The PART believes that the ad hoc committee may turn out to be helpful to EIA, but it is not the type of committee that PART envisioned would be of maximum benefit. PART plans to monitor and evaluate its effectiveness in the coming year. (See Chapter 5.)

AGENCY COMMENTS

In commenting on a draft of this report, the EIA Administrator stated that the report was generally a fair assessment of EIA activities during its first full year of existence, however, certain of PART's conclusions and recommendations merited comment. His comments are contained in Appendix I. In addition, two of the organizations EIA contracted with for data validation work, Lawrence Berkeley Laboratory and Oak Ridge National Laboratory, commented on sections of a draft of this report pertaining to their activities. Their comments are contained in Appendix II and III, respectively.

OVERALL ASSESSMENT

A new organization's first year is bound to be difficult, and EIA's was no exception. However, PART believes that EIA operated independent of the energy policy function, that it was organized and managed in a much more professional manner than its predecessor, the Office of Energy Information and Analysis. Moreover, recent actions including the development of program plans for the Office of Energy Information Validation, the Office of Applied Analysis, and the Office of Energy Information Services, the establishment of interim model documentation standards, and model validation procedure development efforts, indicate that EIA is making progress toward improving the quality and reliability of Federal energy data and analysis activities. However, these are only the first steps and much more needs to be done before EIA fulfills its congressionally mandated charter as the principal source of adequate, accurate, comparable, and coordinated energy information within the Government.

In the coming year, the PART will continue to be alert to possible policy influence, particularly during the preparation of the National Energy Plan II and PART will follow up on the shortcomings mentioned in this report, including evaluating program progress against the objectives and goals set forth by the Congress.

CHAPTER 1

BACKGROUND

The Department of Energy (DOE) Organization Act 1/ established the Energy Information Administration (EIA), bringing together the energy information systems previously situated in the Federal Power Commission, the Bureau of Mines, and the Federal Energy Administration. EIA came into existence on October 1, 1977, when the Department of Energy was established. EIA was created to alleviate the fragmentation of data responsibilities which had been blamed for increasing the energy industry's reporting burden and for contributing to a general lack of understanding of the energy problem.

EIA succeeded the Office of Energy Information and Analysis of the Federal Energy Administration which was established by the Energy Conservation and Production Act. 2/ The Congress established the Office of Energy Information and Analysis because it lacked confidence in the energy data and analyses it was receiving. The absence of credible energy data and analysis has not only hampered the Congress, the President, and the executive departments in intelligently evaluating the array of energy alternatives facing the U. S., but also it contributed to widespread public skepticism regarding the seriousness of the energy crisis.

The responsibilities of the Office of Energy Information and Analysis under the Energy Conservation and Production Act were transferred to EIA by the Department of Energy Organization Act. 3/ EIA is responsible for carrying out a central, comprehensive, and unified data and information program to collect, evaluate, assemble, analyze, and disseminate data and information relevant to energy resource reserves, energy production, demand, technology, and related economic and statistical information. 4/ EIA is required to develop a National Energy Information System containing adequate, accurate, coordinated, comparable, and credible energy information. Such information is needed for energy-related policy decisions by DOE, other Government agencies, the Congress, the President, and the public. 5/ EIA is also responsible for developing a national reserves system to determine the best estimates of fuel reserves and a financial reporting system for the energy-producing companies. 6/

ORGANIZATION

The Act provides that EIA be organized as a separate entity within DOE, insulated from DOE's role in formulating and advocating national energy policy. It also provides that EIA be headed by a professionally qualified administrator who is appointed by the President by and with

the advice and consent of the Senate. 7/ In specifying the character of EIA and in describing some of the statistical and forecasting capabilities and reports desired, Congress attempted to create an organization capable of providing credible energy data and analyses necessary for sound decisions on national energy policy.

On January 3, 1978, Dr. Lincoln Moses, a Professor of Statistics at Stanford University, became the first Administrator of EIA. From EIA's inception in October 1977 to January 1978, the Deputy Administrator of EIA served as Acting Administrator.

The consolidation of energy data activities from various agencies into EIA resulted in its authorized staffing levels being increased from a total of 711 for the predecessor agencies (443 from the Office of Energy Information and Analysis, 140 from the Bureau of Mines and 128 from the Federal Power Commission) to an authorized staffing level of 744 for fiscal year 1978 and fiscal year 1979. Not all of these positions have been filled; 681 were filled as of January 1979. EIA's operating expenses for fiscal year 1978 were approximately \$50.7 million, up \$11.8 million from the \$38.9 spent by its predecessor agencies in 1977 (\$30.7 million by the Office of Energy Information and Analysis, \$2.7 million by the Bureau of Mines, and \$5.5 million by the Federal Power Commission). EIA's major offices are:

1. Energy Data - This Office is responsible for the collection and interpretation of energy data and provides related automatic data processing services to EIA, the Federal Regulatory Commission and the Energy Regulatory Administration and the rest of the Department.
2. Energy Information Validation - This Office is responsible for measuring and documenting the quality of energy information and for developing supporting procedures and techniques.
3. Applied Analysis - This Office is responsible for making energy analyses and forecasts for DOE, other Federal Government agencies, and the Congress; and for developing and maintaining supporting analytical tools such as models.
4. Energy Information Services - This Office is responsible for publishing and distributing all EIA publications, for responding to inquiries for EIA energy data, and for providing assistance to users of energy data including Federal, State and local agencies, the Congress, and the public.
5. Program Development - This Office is responsible for developing and implementing high priority data systems like the Financial Reporting System and the Oil and Gas Information Systems. 8/

YEAR OF TRANSITION

EIA's first year was one of transition during which the data gathering, dissemination, and analysis units of three separate Federal agencies were consolidated into a new organization. Also during its first year, an Administrator, three Assistant Administrators and various office directors and branch chiefs were appointed. As might be expected, a consolidation and reorganization of this magnitude, involving approximately 700 personnel, was not accomplished without some "disruption" and "growing pains."

Also, turnover of EIA officials at upper management levels contributed to the instability which often occurs after a new organization is created. Since EIA's creation in October 1977, the following changes have taken or will take place:

- The Assistant Administrator for Applied Analysis, who was appointed in October 1977, left EIA in April 1978. The present Assistant Administrator of Applied Analysis was appointed in August 1978. 9/
- A new director of the Office of Energy Information Services was appointed in September 1978. 10/
- The Assistant Administrator for Energy Information Validation was appointed in February 1978, 5 months after EIA came into existence. 11/
- The Deputy Administrator who was also the Acting Director of the Office of Program Development, left EIA on January 27, 1979, to take the position as the Special Assistant to the Secretary of Energy. 12/ EIA has not selected a replacement in either position, although the Deputy Assistant Administrator for Applied Analysis is currently acting as head of the Office of Program Development.
- The Administrator of EIA is scheduled to leave in January 1980 to return to Stanford University. 13/

The Professional Audit Review Team (PART) believes the slow progress in the areas of EIA it examined--data validation, data dissemination, and improved computer model credibility--may be attributable to the lack of continuity of upper level management. Many problems might have been anticipated and prevented or at least resolved in a shorter timeframe if EIA had less management turnover. Greater emphasis and priority might have been given to the preparation of program plans for each of its organization units.

In commenting on a draft of this report, the Administrator of EIA acknowledged that there were changes in the senior management of EIA during the last year. Although some delay was experienced, all of the key Assistant Administrators are now in place and the search for a new Deputy is progressing well. He also announced that he will remain on as the Administrator until July or August, 1980. (See Appendix I.)

PROFESSIONAL AUDIT
REVIEW TEAM

PART was formed to review and evaluate EIA's work and to determine whether data collection and analysis activities are being performed in an objective and professional manner consistent with the intent of the Congress. 14/ In accordance with the authorizing legislation, members of PART are drawn from the following Federal offices or agencies: 15/

General Accounting Office
Bureau of the Census
Securities and Exchange Commission
Federal Trade Commission
Council of Economic Advisers
Bureau of Labor Statistics

The DOE Organization Act provides for PART to make an annual professional audit of the EIA. 16/ PART reported the results of its first evaluation to the President and the Congress on December 5, 1977, in a report entitled "Activities of the Office of Energy Information and Analysis, Federal Energy Administration."

Scope of Review

This report describes the results of our evaluation for the period from EIA's inception in October 1977 through March 1979. During this period, our staff was located at EIA offices and reviewed documents, studies, reports, correspondence, and other records from the files of EIA and DOE. We also interviewed officials of EIA and DOE. Moreover, energy officials from business, research firms, and educational institutions were contacted to obtain the widest possible range of information upon which to base our evaluation of EIA. We also interviewed officials at the Lawrence Berkeley Laboratories and the Oak Ridge National Laboratories (EIA contractors) as well as staff members of various congressional committees.

In this review, we concentrated on the following matters: policy influence, procedures to validate data, efforts to develop a National

Energy Information System, and the integrity of the mathematical and statistical modeling activities.

In the coming year, we plan to select areas for review where our evaluation may be of greatest assistance to the Congress and the President. This would cover such areas as, but not necessarily be limited to (1) determining whether EIA maintains its independence from the energy policy function; (2) evaluating EIA's performance against its program plans for the Offices of Energy Data, Energy Information Validation, Applied Analysis, and Energy Information Services; (3) evaluating EIA's efforts to validate energy data systems; (5) evaluating EIA's progress in establishing a National Energy Information System; (6) integrating the Bureau of Mines, and Federal Power Commission personnel into EIA; (7) determining the relevancy of data collected and published by EIA; and (8) determining whether the shortcomings pointed out in this report have been corrected.

The PART staff members are:

Mr. William F. McGee, General Accounting Office

Mr. Frank J. Gross, General Accounting Office

Mr. Thomas R. Broderick, General Accounting Office

Dr. Helen Scott, Securities and Exchange Commission

Mrs. Eileen F. Whelan, Securities and Exchange Commission

FOOTNOTE REFERENCES

- 1/ Public Law 95-91, August 4, 1977.
- 2/ Public Law 94-385, August 14, 1976.
- 3/ Public Law 95-91, August 4, 1977 (sec. 205[c]).
- 4/ Public Law 95-91, August 4, 1977 (sec. 205[a][2]).
- 5/ Public Law 94-385, August 14, 1976 (part C, secs. 141 and 52).
- 6/ Public Law 95-91, August 4, 1977 (sec. 205).
- 7/ Public Law 95-91, August 4, 1977 (sec. 205).
- 8/ EIA organizational charts and mission and function statements.
- 9/ Statement of an official, Office of Policy and Evaluation, EIA, personal interview, March 30, 1979.
- 10/ Ibid.
- 11/ Statement of an official, Office of Management Services, EIA, telephone interview, February 2, 1979.
- 12/ Statement of an official, Office of Personnel Management, DOE, telephone interview, January 31, 1979.
- 13/ United States Senate, Committee on Energy and Natural Resources, The Nomination of Dr. Lincoln E. Moses to be Administrator of EIA, December 13, 1977 (Washington: Government Printing Office, 1978), page 10.
- 14/ Elmer B. Staats, Comptroller General, U.S. General Accounting Office, letters to Julius Shiskin, Commissioner, Bureau of Labor Statistics; to Juanita Kreps, Secretary of Commerce; to Charles L. Schultze, Chairman, Council of Economic Advisers; to Roderick M. Hills, Chairman, Securities and Exchange Commission; and to Calvin J. Collier, Chairman, Federal Trade Commission, explaining their responsibilities to appoint representatives to PART and announcing the appointment of Richard W. Kelley as Chairman, February 16, 1977.
- 15/ Public Law 94-385, August 14, 1976 (secs. 142 and 55[b]).
- 16/ Public Law 95-91, August 4, 1977.

CHAPTER 2

EIA ACTIVITIES INDEPENDENT OF ENERGY POLICY FUNCTION

PART found no reasons to question EIA's independence from the energy policy function. Upon creation of DOE, the responsibility for formulating and advocating national energy policy was separated from the energy data collection and applied analysis function, as originally mandated by the Energy Conservation and Production Act. This continued separation of functions has strengthened EIA's position as an independent source of energy data and analysis. Further, EIA was organized and administered in a manner designed to promote its credibility as a neutral source of energy data and energy analyses.

The EIA operation most susceptible to political or policy influence is the Office of Applied Analysis. The Office makes detailed forecasts and analyses of the impact of energy policy alternatives on energy supplies, demand, costs, and prices through the use of computer models and independent professional judgement. By adjusting certain input variables, alternative forecasts can be produced to evaluate a wide range of policy alternatives. The Office of Applied Analysis is responsible for making independent forecasts and analyses for the EIA Administrator's Annual Report. It also responds to requests for special forecasts and analyses from other DOE organizations, Federal and State organizations, congressional committees, industry, academia, and the general public. The Office of Applied Analysis has established procedures to record the assumptions that requestors external to EIA want incorporated into their forecasts and analyses and to assure that the resulting products are clearly described as having been prepared at a client's request. Also, a public record is maintained of all requests for analytical services, the products furnished, and the assumptions the products were based on. ^{1/} In 1978, the results of approximately 40 analysis memoranda were published. These procedures apply to all requests from sources external to EIA including policy sensitive requests from the Secretary of DOE, the DOE Office of Policy and Evaluation, and congressional committees. PART's analysis of a representative sample of the resulting analytical products revealed no evidence of policy bias.

This contrasts sharply with our findings when we reviewed EIA's predecessor organization, the Federal Energy Administration's Office of Energy Information and Analysis. That organization, in effect, operated as an extension of the energy policy and planning staff of the Executive Office of the President.

ADMINISTRATOR'S
ANNUAL REPORT

The EIA Administrator's Annual Report, is a congressionally mandated report containing energy supply and demand trends and projections under various assumptions. In 1978 EIA published its Administrator's Annual Report and designed its projections to encompass differing viewpoints and to minimize bias in the results. The report presents a variety of projections based on differing assumptions with regard to economic growth, the probable levels of recoverable U.S. oil and gas resources, and changes in the real price of imported oil. Also, in order to avoid predicting the future course of Government energy policy, EIA has assumed continuation of present energy policy as expressed in existing legislation and actual practice. 2/ The Administrator's 1977 Annual Report appears to be a straightforward, unbiased presentation of the information needed for decision making.

DOE'S POLICY AND EVALUATION
MODELING EFFORT

One area of concern that has come to our attention relates to EIA's role, or lack thereof, in providing analytical products to assist the Assistant Secretary for Policy and Evaluation, the DOE organization responsible for assisting the Secretary and others in formulating national energy policies. In carrying out this work, the Policy and Evaluation Office not only requests computer model based analyses from EIA, but it performs analyses utilizing computer models developed and operated by contractors. 3/ EIA is generally perceived to have an important role in providing analyses to DOE policymakers even though this is not always the case. Therefore, it is not clear to what extent energy policy formulation is being influenced by the analysis furnished by EIA or by analysis acquired from other sources. It is also unclear whether the Policy and Evaluation Office's use of other than EIA analytical products circumvents the congressional intent in establishing EIA as a neutral and credible source of analysis to assist energy policymakers in DOE, other Government agencies, the Congress and the public.

The General Accounting Office (GAO), in a review unrelated to the PART work, was advised by the Office of Policy and Evaluation officials that it employed contractors because EIA could not respond to its requests in a timely manner. We understand that GAO plans to look into this matter in the coming year.

CONCLUSION

We conclude that EIA operations are not being affected by energy policy influences based on our review of (1) pertinent EIA records and files, (2) the EIA's 1977 Administrators Annual Report, and (3) analytical products furnished to a variety of requestors.

FOOTNOTE REFERENCES

- 1/ EIA Order number EI-5910.1, May 2, 1978, Requests for Analytical Services of EIA.
- 2/ EIA, Annual Report to Congress, Volume II, 1977, Projections of Energy Supply and Demand on Their Impacts, April 1978, pp. xv-xvi.
- 3/ Statement of officials, Office of Policy and Evaluation, DOE, to GAO staff members, January 1979.

CHAPTER 3

ENERGY INFORMATION VALIDATION

PART's first report described a lack of progress by EIA's predecessor agency in verifying the energy data collected (directly or through contract), analyzed, and reported by it. Our report concluded, at that time, that the accuracy of most energy data was undetermined and the charge that incorrect data and information had been reported to the public and used as a basis for national energy policy could be neither proved nor disproved. 1/

In commenting on a draft of that report, the Secretary of Energy generally agreed with PART and stated that EIA would (1) emphasize verifying the accuracy and validity of energy data; (2) make a firm commitment to provide the necessary resources to carry out this function; and (3) develop, as one of EIA's first tasks in this area, a detailed program plan which includes schedules and resources required to validate all energy data systems. 2/ Over a year has passed since the Secretary made these comments and although EIA devoted increased attention and resources to data validation activities, little progress has been made in actually determining the accuracy and reliability of energy data.

EIA established an Office of Energy Information Validation and appointed an Assistant Administrator as its head. This office is responsible for developing procedures and methodologies needed to validate Federal energy information and systems and for conducting validation and verification reviews of such information and systems. 3/ To accomplish its responsibilities the Validation Office contracted with 3 different organizations to conduct pilot validation studies of 14 of the 55 existing EIA energy information systems, involving 15 out of a total of 185 forms. Because validation officials were uncertain how data systems should be validated, each contractor was charged with developing an acceptable data validation methodology in the course of validating energy information systems. However, the contractors had neither experience in the data validation area nor clear-cut direction from EIA's Validation Office. As a result, managerial, planning, and directional problems plagued all the contractors.

As of February 1979, after many delays and serious mismanagement, one of the contracts was allowed to expire, and a second contractor was instructed to closeout its work by June 1979, even though final validation reports will not be completed. A third contractor submitted draft reports on two of the systems it is responsible for validating and is continuing work on the others.

As these contracts were administered, validation officials became aware that these contract efforts were not going to adequately validate the systems. The Assistant Administrator for Energy Information Validation stated, in a November 20, 1978 memo, that none of the pilot efforts provided a sufficient validation of the targeted energy data system. The memo stated an intention to expand and refine such efforts in fiscal year 1979 to meet minimum standards.

The Validation Office rationale for employing contractors was that there were insufficient personnel to do the validation work in-house. Only 2 persons were assigned to validation activities when the Office was established, but the number gradually increased to 27 professionals as of February 1979. 4/

One of the reasons that contractual efforts have proven to be generally inadequate from the standpoint of verifying and validating energy data systems is that contract objectives were never clearly defined. This can be attributed, in a large measure, to the fact that the goals and objectives of the Office of Energy Information Validation were not clearly defined at the time the contracts were awarded. As a result, although increased attention and resources have been applied to data validation, the basic conclusion of PART's first report that the accuracy of most energy data is undetermined remains essentially unchanged.

PROGRAM PLAN OF OFFICE
OF ENERGY INFORMATION
VALIDATION

EIA developed a program plan for the Office of Energy Information Validation in February 1979. 5/ The plan lays out, in a unified, comprehensive, and detailed fashion, the Validation Office's overall mission, goals, tasks, products, objectives, organizational structure, and strategy for carrying out the plan. The plan anticipates completion of initial validation of all EIA energy systems by 1986, with periodic review thereafter assuming availability of adequate funding. The Office of Energy Information Validation intends to use this plan as a management tool for planning the direction of program objectives and projects, tracking estimated timeframes and managing resources.

The Validation Office's program plan centers around its main goal which is to "obtain and maintain current knowledge of the quality of EIA's information base, develop recommendations for improving the meaningfulness and accuracy of EIA's information products, and communicate both." To accomplish this goal, validation officials have set the following eight tasks:

1. A review of all proposed new and revised data collection forms or systems as they are developed to determine that definitions are precise and consistent with standard usage and that the list of respondents is properly selected.
2. Determination of the information needed for particular energy subject areas and comparing the requirements with what the existing data collection systems state that they collect.
3. Performance of a detailed evaluation of all aspects of the systems design including respondent universe, sample size, and nonrespondent rate.
4. Verification of the accuracy of information submitted by respondents by going into the field and checking raw data.
5. Validation of models and analyses.
6. Monitor projections published by EIA and compare them with the actual events.
7. Performance of special studies, when requested by the Administrator, to investigate apparent deviations in energy statistics, problems with energy data series and analyses, and other issues.
8. Review of all EIA publications to ensure that they provide accurate descriptions of the quality of information being published. 6/

The development of a program plan for the Office of Energy Information Validation in February 1979 was a critical first step. PART plans to closely monitor progress against the plan in coming months.

INFORMATION VALIDATION EFFORTS

The Validation Office staff was concerned with improving the quality of energy data by assisting other EIA and DOE organizations in designing, developing, and approving new data survey forms and in developing verification and validation techniques and methodologies, and attempting to validate 14 energy data systems. (See Appendix IV for list of systems.)

Present validation officials recognize that a strong energy information validation function is an integral component in assuring

the accuracy and credibility of all energy information collected by the Federal Government. 7/ However, they found that, at the time of the organization of DOE, comprehensive validation methodologies were virtually nonexistent. As noted in last year's PART report, EIA's predecessor agency and other Federal components brought into the new department engaged in only limited verification and validation efforts. 8/

In accordance with the following criteria, 9/ validation officials had selected 14 energy data collection systems for validation.

- The system should be operational and not undergoing change.
- The system should be a source of information for the Monthly Energy Review, Quarterly Report to Congress, and/or the Monthly Petroleum Statistics Report, or be a key regulatory data system.
- Crude oil and natural gas data should be included in the selected systems.
- Systems collecting coal and electricity data should be included.
- At least one system should be selected which collects cost and/or price data.

The Validation Office contracted the Kindle Corporation, the Lawrence Berkeley Laboratory, and the Oak Ridge National Laboratory to perform its data validation work. The contracts called for developing energy data validation methodology and validating a total of 14 energy data systems.

VALIDATION EFFORT OF KINDLE CORPORATION

On September 27, 1977, the Office of Energy Information and Analysis awarded a \$206,000 contract to Kindle Corporation, a Maryland consulting corporation, to validate five energy data systems. The general scope of work, as originally agreed to, required that Kindle determine the validity and associated user requirements of five existing energy data systems. 10/ EIA officials subsequently shifted primary emphasis to methodological development since adequate system methodology did not exist. EIA officials further decided that the five systems originally selected for validation by Kindle were to be used as pilot

projects for the methodology work. Reports on the methodological approaches developed and the review results obtained were to be completed by May 31, 1978.

The Validation Office experienced significant problems with the contractor's project management and work product quality. As early as December 1977, Validation Office officials questioned the ultimate success of the effort. These concerns centered around the adequacy of planning for specific contract tasks, the adequacy of the technical scope of tasks involving the translation of user requirements into data specification, the quantification of data quality, and the estimation of recommended system modification costs. 11/

In April 1978, Validation Office personnel worked with the contractor in an attempt to better define contract tasks and projected completion dates. The expected completion date was extended to October 31, 1978. Progress on these tasks was continuously monitored by the Validation Office staff. Even so, the preliminary drafts received in June 1978 on two systems, the Joint Petroleum Reporting System and the Prime Suppliers Monthly Report were unsatisfactory. After review of these drafts, Validation Office officials concluded that Kindle Corporation was unlikely to deliver a satisfactory product on any of the five systems that Kindle was validating. 12/ As a result, the Validation Office allowed its contract with Kindle to expire. 13/ Under the expiration procedure developed, Kindle Corporation was held responsible for preparing a preliminary draft validation report on each of its five systems. It was also required to organize and submit all files and supporting materials relating to its validation effort to the Validation Office. 14/ The contractor was awarded an additional \$69,200 to provide the funding it needed to produce the specified reports and supporting documentation.

During October 1978, the five systems were transferred to Lawrence Berkeley Laboratory and Oak Ridge National Laboratory for completion of the necessary validation work and final report preparation. All relevant supporting documentation produced by Kindle was made available to these laboratories.

VALIDATION EFFORT
OF LAWRENCE BERKELEY
LABORATORY

In March 1978, the Validation Office contracted with Lawrence Berkeley Laboratory to examine five energy information systems and to provide an assessment of the validity of these systems. Funding for this contract for fiscal year 1978 was \$1.1 million. This contract

continued in fiscal year 1979 with funding of \$1.4 million. For the systems selected the contract specifically required that Berkeley:

- Determine the information requirements of system users and how well these requirements are met.
- Determine the quality and accuracy of information provided by energy information systems.
- Identify the modifications to the systems and/or user information specifications needed to insure that user requirements are met efficiently. 15/

In conjunction with these tasks, Lawrence Berkeley also began a data validation methodology development program which was designed to prepare an analytical framework for data validation. Initial efforts were directed toward locating areas where new techniques and concepts may increase the efficiency and reliability of validation.

In monitoring this contract, validation officials identified many of the same types of directional, managerial, and administrative deficiencies that plagued the Kindle contract. Validation officials believed, at the inception of this contract, that Lawrence Berkeley was devoting insufficient managerial and administrative support and they found that the situation worsened as work on the contract progressed. 16/

During the same timeframe that the Validation Office was experiencing problems with Lawrence Berkeley, the Office of Management and Budget had cut the EIA fiscal year 1979 supplemental budget request for information validation funding from \$15 million to \$4.1 million. 17/ Because of these two factors, a re-evaluation of the Lawrence Berkeley effort was made by the Administrator of EIA. It was decided to close-out the work in June 1979 without completion of the validation reports. A decision regarding whether the remaining validation work will be performed by Lawrence Berkeley or by the expanded data validation staff in EIA has not been made. 18/

In commenting on a draft of a portion of this report, officials at Lawrence Berkeley Laboratory stated that the sudden termination of the program was caused by the absence of sufficient funds at the Office of Energy Information Validation contrary to their understanding of the situation. Lawrence Berkeley was advised by the Validation Office in October 1978, that \$2.6 million had been approved by the EIA Financial Officer and DOE's Office of the Controller to fund data validation work at the Laboratory. Lawrence Berkeley officials were surprised to learn in January 1979 that the agreed-upon funding of \$2.6 million would

not be forthcoming. Lawrence Berkeley officials said termination of the program caused layoffs, termination of consultant services and has had a deleterious effect on its employee moral. (See Appendix II.)

VALIDATION EFFORT OF
OAK RIDGE NATIONAL
LABORATORY

In March 1978, the Validation Office contracted with Oak Ridge National Laboratory for data validation and methodology work on four energy data systems. Fiscal year 1978 funding for this project was \$1.3 million. For fiscal year 1979, Oak Ridge was given the additional responsibility of taking over two of the energy data systems originally started by Kindle Corporation and their fiscal year 1978 contract was expanded by \$2.8 million. The fiscal year 1978 contract specifically required that Oak Ridge:

- Determine the quality and accuracy of energy information provided by the energy information systems selected.
- Determine whether or not the data requirements of information users are sufficient and comprehensive and are in fact met by the information systems selected.
- Identify required modifications to systems and/or user information specifications to insure that user requirements are in fact met.
- Develop and apply new approaches to energy data validation.
- Perform validation methodology research in such areas as sampling, data editing, respondent burden, and development of information processing tools to assess oil and gas reserves information.
- Identify areas where additional methodological development is necessary. 19/

In August 1978, validation officials expressed concern about an overall employment ceiling imposed on Oak Ridge by DOE which effected the data validation effort. 20/ The project director at Oak Ridge indicated that at least 24 people were needed, but only 14 were assigned

to the project. 21/ Consequently, Oak Ridge used outside contractors for portions of the system validation efforts.

In addition to the four data systems assigned to Oak Ridge, in October 1978 it accepted the responsibility for completing the systems validation work on two additional energy data systems originally begun by Kindle Corporation.

In spite of the use of subcontractors and a slippage of its original November 1978 delivery date, the Validation Office believed that Oak Ridge was more successful than the other two validation contractors. In October and December 1978, Oak Ridge submitted two draft reports to the Validation Office covering (1) the Capacity of Petroleum Refineries System and (2) the Industrial Energy Efficiency Improvement Program and the Voluntary Business Energy Consumption Program. The Validation Office determined that these draft reports formed the basis for acceptable final products. Final reports on these two systems and on four other systems are to be completed between March 1 and September 30, 1979. We plan evaluating the final reports in the coming year.

In commenting on a draft of a portion of this report, Oak Ridge National Laboratory stated that although a correct general impression of its role was given, the draft did not describe the Laboratory's work in developing data validation methodologies. Oak Ridge stated that its reports had been delayed because it needed to learn how to validate energy data systems and that the delays will permit significantly higher quality products to be submitted. (See Appendix III.)

NEW LEGISLATIVE RESPONSIBILITIES

In addition to the development and application of information validation methodologies to existing data systems, the Validation Office attempts to improve the reliability of new data systems by assisting in their design and development.

The Department of Energy Organization Act of 1977 gave EIA the responsibility for developing and implementing two new data systems—the Financial Reporting System and the Oil and Gas Information System. 22/ The tasks involved in establishing these systems were given to units of the Office of Program Development with validation support to be provided by the Office of Energy Information Validation.

Financial Reporting System

EIA's primary goal is to specify, develop, and initially implement data systems for a Financial Reporting System that provides, on a recurring basis, financial and operating performance data concerning companies in the energy related industries. The principal focus is on the specification of the data elements appropriate to the analysis of the structure, conduct, and performance of the energy industry. The scope of this effort includes analysis of legislative requirements, analysis of existing relevant data collection efforts, review of identified internal DOE and external agency needs, development of data collection forms and instructions that meet these requirements and are consistent with EIA standards, specification of standard report products to be generated from the data bases, and coordination of the development of the associated computerized data system. 23/

EIA has developed FORM EIA-28 as the primary data collection device. It has been forwarded, in final form, to 27 major energy-producing companies. Although the completed forms were scheduled to be returned to EIA in February 1979, most respondents requested and received 60 to 90 day extensions to the filing deadline. The first cycle (1977 data) will therefore not be completed until April-May 1979. In a review not related to the PART work, GAO has closely followed EIA's efforts in the development of the financial reporting system and has issued two reports critical of these efforts. The principal concern expressed in the GAO reports is that EIA has not adequately defined its data needs and has not sufficiently planned the use it will make of the data collected. GAO is concerned about the form's usefulness to data users. It believes the form may contain too much data, too little data, or simply data in the wrong format for its eventual users. GAO does not question the sufficiency of the proposed system to meet the legal requirements, but believes a serious question exists as to whether the proposed form contains the data needed by the system's users. 24/

Oil and Gas Information System

The act calls for EIA to develop and implement a program which will collect, evaluate, assemble, analyze, and disseminate data and information which is relevant to energy source reserves, energy production, demand, and technology, and related economic and statistical information, or which is relevant to the adequacy of energy resources in the short and long term. 25/

EIA has instituted an annual survey of domestic oil and gas reserves and production known as the Oil and Gas Information System. The data collection program is being conducted within the Office of Program Development. The supporting Oil and Gas Information System data validation program is being conducted by the Office of Energy Information Validation.

The purposes of this project are to:

1. Build a system that contains data needed to develop reliable estimates of reserves, resources, and time-production profiles for crude oil, natural gas, and natural gas liquids for the U.S. and other nations.
2. Provide data needed by analysts to evaluate changes in productive capacity and supply and the conversion of oil and gas resources to producible reserves as a function of price, technology, and other factors. 26/

Two mailings are scheduled for fiscal year 1979. The first, beginning in January, will collect oil and gas information for 1977 and the second, beginning in July, will collect information for 1978. A report on the information obtained from the first mailing is planned for the November-December 1979 timeframe.

In December 1978, the Validation Office prepared a validation task plan for the Annual Survey of Domestic Oil and Gas Reserves. 27/ The tasks to be conducted by the Validation Office will concentrate on six general areas:

- Assessment of the data collection instrument to determine if it satisfies user requirements.
- Evaluation of the statistical assumptions and respondent sample employed.
- Evaluation of the automated and manual processing techniques, procedures, and operations.
- Determination of respondent understanding of forms, instructions, and definitions, and associated reporting burden.
- Comparison of data collected to estimates developed from a number of other sources.

- Documentation and publication of findings, conclusions, and recommendations.
- Development of independent field reserve estimates.

The Validation Office expects to have all findings, reports, methodologies, and techniques developed reviewed by non-EIA experts to determine technical competence.

CONCLUSION

The Validation Office has been in existence for over a year; its professional staff has grown from 2 to 27 people and it has spent about \$3.0 million for data validation contracts in fiscal year 1978. Contract funding for that portion of the validation program for existing systems is about \$4 million in fiscal year 1979. However, little has been accomplished in the way of improving the accuracy, reliability, and overall credibility of energy information.

The difficulty the Validation Office has experienced in obtaining satisfactory performance from its validation contractors is attributable to the lack of a clearly defined statement of its mission and a program plan laying out how that mission can be best accomplished. On August 24, 1978, PART requested an inventory of EIA data systems, the status and/or plans to validate each system, and an overall data validation program plan. The type of information we requested was necessary for EIA to formulate and operate a data validation program and also needed by PART to review the data validation effort. The PART request is contained in Appendix V and includes

- the name of data systems and products produced,
- the cost of system and collection agency,
- the survey design,
- the status of validation efforts, and
- other background information related to planning for data evaluation.

Although EIA agreed the information requested by PART was relevant and useful to its own operation, it took EIA until February 1979, 5 months after our request, to furnish us with the data. At roughly the same time, EIA developed a program plan for data validation.

The information in this inventory of EIA data systems is a starting point for data validation efforts. The 185 forms identified in the inventory are cross-referenced against EIA's 55 major data systems and the status and plans of validation efforts are identified in the Office of Energy Information Validation's program plan. This inventory, in conjunction with the validation office program plan, identifies the work it will do in validating energy data systems in the next 5 years. Procedures should be implemented to assure that the inventory is updated to reflect new and/or expired forms and also expanded to cover data collection activities performed by other organizations, but sponsored and paid for by EIA.

The PART believes that a clear and carefully thought-out data validation program plan that systematically identifies attainable objectives was an essential prerequisite to developing an effective, well-managed data validation program. The Validation Office has now developed such a program plan in February 1979 after operating for over a year without one.

PART is hopeful that the validation program plan and the knowledge gained on data validation methodology through its contractors will allow the Validation Office to move forward in the coming year toward determining the accuracy and reliability of energy data, something not done in the past year.

In commenting on a draft of this report, the EIA Administrator agreed that the pilot studies had not progressed as well as had been hoped; however, he expects final validation reports to be completed on six systems in the coming year. Further, he stated that substantial progress had been made by the Validation Office in five areas including the development of a data validation methodology. (See Appendix I.) We believe that assessing the accuracy and reliability of energy data should be the Validation Office's highest priority and the lack of tangible results in the way of completed validation reports or evidence that a satisfactory data validation methodology was being developed supports our conclusions that EIA has made little progress in determining the accuracy and reliability of energy data.

FOOTNOTE REFERENCES

- 1/ PART, Activities of the Office of Energy Information and Analysis, Washington, D.C., December 5, 1977.
- 2/ James R. Schlesinger, Secretary of Energy, November 7, 1977, letter to Richard W. Kelley, Chairman, PART.
- 3/ EIA organizational charts and mission and function statements.
- 4/ Statement of an official, Office of Energy Information Validation, EIA, telephone interview, February 2, 1979.
- 5/ Office of Energy Information Validation Program Plan, EIA, February 23, 1979.
- 6/ Ibid.
- 7/ PART, Activities of the Office of Energy Information and Analysis, Washington, D.C., December 5, 1977, pp. 23-24.
- 8/ Ibid.
- 9/ Memo from C. William Fischer, Deputy Administrator, EIA, for distribution, concerning energy data validation, December 28, 1977.
- 10/ Department of Energy, contract number CR-03-70237-00, awarded September 27, 1977.
- 11/ Wallace O. Keene, Office of Energy Information Validation, EIA, December 16, 1977, letter to Mr. David Stone, Kindle Corporation.
- 12/ Memo from Charles S. Smith, Assistant Administrator, Office of Energy Information Validation, EIA, for Charles Shirkey, Brian Poole, Bill Miller, Lew Zutovsky, concerning Kindle contract, July 26, 1978.
- 13/ Charles S. Smith, Assistant Administrator, Office of Energy Information Validation, EIA, July 28, 1978, letter to Dr. David J. Bowering, Acting President, Kindle Corporation.
- 14/ Memo from Charles S. Smith, Assistant Administrator, Office of Energy Information Validation, EIA, for Charles Shirkey, William Miller, Brian Poole, concerning transfer of Kindle Systems, August 7, 1978.

- 15/ Lawrence Berkeley Laboratory, Form 189, No. 4708; Contract No. W-7405-ENG-48, Validation Studies of Selected Energy Data Collection Systems.
- 16/ Memo from Charles S. Smith, Assistant Administrator, Office of Energy Information Validation, EIA, for Lincoln E. Moses, Administrator, EIA, concerning management and administrative support at Lawrence Berkeley Laboratory, August 4, 1978.
- 17/ Statement of an official, Office of Energy Information Validation, EIA, telephone interview, February 2, 1979.
- 18/ Statement of an official, Office of Energy Information Validation, EIA, personal interview, February 27, 1979.
- 19/ Oak Ridge National Laboratory, Contract number W-7405-ENG-26, DOE activity number FK020102, for fiscal year 1978 and FK0301 for fiscal year 1979, Form 189 number 00001, Comprehensive Validation Studies of Selected Energy Data Collection Systems.
- 20/ Telex from Joseph A. Lenhard, DOE, Oak Ridge, Tennessee to Charles Smith, Assistant Administrator, Office of Energy Information Validation, EIA, August 1978, regarding employment ceiling.
- 21/ Andrew S. Loebl, Oak Ridge National Laboratory, August 14, 1978, letter to John S. Shewmaker, Office of Energy Information Validation, EIA.
- 22/ Public Law 95-91, August 4, 1977, (sec. 205).
- 23/ EIA organizational charts and mission and function statements.
- 24/ GAO, Improvements Needed in the Department of Energy's Effort to Develop a Financial Reporting System, (EMD-78-95), July 31, 1978, and GAO, letter report on the Financial Reporting System, (EMD-78-112), November 1, 1978.
- 25/ Public Law 95-91, August 4, 1977, (sec 205[a][2]).
- 26/ EIA organizational charts and mission and function statements.
- 27/ EIA, Office of Energy Information Validation, Draft Validation Tasking Plan for the Annual Survey of Domestic Oil and Gas Reserves, November 20, 1978.

CHAPTER 4

STATUS OF EFFORTS TO DEVELOP A NATIONAL ENERGY INFORMATION SYSTEM

The Energy Conservation and Production Act required an authoritative source of adequate, accurate, comparable, coordinated, and credible energy information within the Government. The System is to contain the information necessary to provide a description of and to facilitate analysis of energy supply and consumption according to geographic and economic sectors. 1/

At a minimum, legislation states that the System shall contain such energy information as is necessary to carry out the Administration's statistical and forecasting activities. The legislation also states that the System should include, at the earliest date and to the maximum extent practical, such energy information as required to define and permit analysis of:

- The institutional structure of the energy supply system.
- The consumption of mineral fuels, nonmineral energy resources, and electricity.
- The sensitivity of energy resource reserves exploration, development, production, transportation, and consumption to economic factors, environmental constraints, technological improvements, and substitutability of alternative energy sources.
- The comparability of energy information and statistics that are supplied by different sources.
- Industrial, labor, and regional impacts of changes in patterns of energy supply and consumption.
- International aspects of the evolving energy situation.
- Long-term relationships between energy supply and consumption in the United States and world communities. 2/

EIA'S LACK OF PROGRESS
IN DEVELOPING A NATIONAL
ENERGY INFORMATION SYSTEM

Before the Office of Energy Information and Analysis could implement the National Energy Information System, it needed to develop a conceptual design and implementation plan. The Office of Energy Information and Analysis, EIA's predecessor agency, made no serious attempt to establish a System until July 1977, almost a year after the legislation was passed, when it wrote a proposal for the development of a conceptual design and an implementation plan. This led to the award of a contract to Logistics Management Institute on September 29, 1977, for \$85,000. 3/ The six major tasks to be performed under this contract were to:

- Develop the System's conceptual design.
- Design the structure, relationships, and procedures for operating the System.
- Develop documentation and validation procedures.
- Develop selection criteria for inclusion of data systems into the System.
- Recommend form and format for output presentation.
- Develop a detailed implementation plan consistent with the conceptual design and operational structure resulting from the above tasks. 4/

Logistics Management
Institute Proposal

Logistics Management Institute completed its final report in May 1978. The conceptual design it developed has the following characteristics:

1. The National Energy Information System would be constructed to provide both data and reference information to support analysis of energy issues by the Government and private industry.
2. Forecasts and other principal results of modeling and analysis would be included in the system, but the models and analytical processes would not.

3. The National Energy Information System would contain, or have direct access to, the most frequently used energy data. Data less frequently used would be referenced by the System through a dictionary so that the user would know where and how to obtain the data from another system.
4. An information classification scheme would be used so that information could be accessed by topic as well as by direct data request.
5. The National Energy Information System would be implemented as a network system with centralized control and distribution.
6. The National Energy Information System would be implemented incrementally. Logistics Management Institute recommended that the agency begin by including the following:
 - Respondent Information System.
 - Project Independence Evaluation System data base and output.
 - Federal Energy Data System.
 - Financial Reporting System.
 - Joint Petroleum Reporting System.
7. The institute estimated that the initial System would cost about \$400-\$600 thousand. 5/

The System's proposed conceptual design and implementation plan was reviewed by EIA officials and their comments indicate that the proposal would not satisfy the requirements of the legislation. 6/

First Office of
Energy Data Proposal

The Office of Energy Data in EIA used the Logistics Management Institute study and the comments on it to prepare its proposed System design and implementation plan which was submitted to the Administrator of EIA on October 11, 1978. At the heart of this proposal was the development of an automated master directory encompassing existing energy

data systems, forms, and output reports. Through this master directory, direct access to data already contained in the EIA on-line computer system would be possible. The Office of Energy Data estimated that the incremental cost of implementing the National Energy Information System envisioned in this plan would be minimal because of its almost total reliance on existing data systems. 7/

On October 24, 1978, the Administrator of EIA rejected this proposal because it automated only information already possessed by EIA and it did not satisfy the legislative requirements that it be an authoritative source of adequate, accurate, comparable, coordinated, and credible energy information within the Government. The proposal also did not address the questions of how data should be collected or what reporting mechanisms should be integrated into the System. 8/

Second Office of Energy Data Proposal

On November 1, 1978, the Office of Energy Data Development presented a draft of its second proposed National Energy Information System development plan to the EIA Administrator. This plan which incorporates most of the key features that were common to previous studies, estimates full implementation to cost \$1.3 million. 9/

As of March 1979, the draft of this plan was being reviewed by the Administrator of EIA. 10/

EIA Takes Positive Step In Developing The National Energy Information System

The Logistics Management Institute study and the two proposals prepared by EIA staff each call for an automated Information Element Dictionary as the cornerstone of the System. Accordingly, even though the EIA Administrator is still considering the most recent proposed plan, a procurement request is being prepared to update, expand, and fully automate an Information Element Dictionary. 11/ The current dictionary is in manual form and consists of 25 volumes describing about 9,200 information elements. This form of the dictionary is used principally in the forms clearance and consolidation efforts of EIA. The proposed form of the dictionary would improve the classification scheme, expand coverage to automated data files, reports, publications, and models, and provide for retrieval of data from automated files.

OFFICE OF ENERGY
INFORMATION SERVICES

Although EIA's efforts to design, plan, and implement a National Energy Information System have failed to produce tangible results, EIA has been actively cataloging, publishing, and disseminating energy information and reports and responding to inquiries through its Office of Energy Information Services. This Office operates the Energy Information Administration Clearinghouse and National Energy Information Center. 12/

The Clearinghouse is responsible for editing, publishing, and distributing EIA publications. During 1978, approximately 450 EIA periodic or one-time statistical reports were produced 13/ and distributed to nearly 1 million individuals. 14/

The National Energy Information Center was carried over from the Federal Energy Administration and serves as the focal point in the Federal Government for energy information. It acts as a referral service to other Federal, State, and local agencies; the academic community; industrial and commercial organizations; and the general public regarding the availability of energy information in EIA, DOE, or from other sources. During 1978, it received an average of 1,650 requests for assistance per month. 15/ Some requests were directly answered by the Center while others were referred elsewhere in DOE. The Center will also operate the National Energy Information System if it is developed and implemented.

CONCLUSION

Only limited progress has been made in developing the National Energy Information System in the nearly 2-1/2 years that have passed since the legislation setting forth the requirements of such a system was enacted. EIA senior management officials found two conceptual design and implementation plans to be inadequate and a third was under review by the Administrator as of March 1979. In the meantime, EIA has been collecting, cataloging, publishing, and disseminating a considerable volume of energy information. Although the PART did not attempt to evaluate the efficiency or effectiveness of EIA's clearinghouse or National Energy Information Center, we believe that these activities are worthwhile and will form the operational nucleus of the National Energy Information System if it is implemented. We believe that the December 1978 program plan prepared for the Office of Energy Information Services establishing objectives and scheduled accomplishments for the Office's publication and dissemination, information assistance, and outreach support functions will give a greater sense of direction

to these operations and permit EIA senior management to evaluate their performance. We further believe that EIA is confused about what the legislation requires of them in designing and implementing the National Energy Information System.

RECOMMENDATION

We recommend that the Congress clarify its intentions as to what it wants the National Energy Information System to contain so that EIA can design and implement a System that will satisfy it, executive agencies, and the public. Such action could help prevent the incurrence of unnecessary costs by avoiding the development of a system that did not meet congressional requirements.

In commenting on a draft of this report, the Administrator of EIA acknowledged that the National Energy Information System has been slow to take form, but the legislation on establishing a System is clear to EIA. He believes it would be wise to allow the many projects EIA has been working on toward establishing a National Energy Information System to unfold rather than to seek more specific legislative guidance at this time. (See Appendix I.) PART believes clarification of the legislation in designing and implementing a National Energy Information System would be useful to EIA.

FOOTNOTE REFERENCES

- 1/ Public Law 94-385, (sec 142 and 52[a][b]), August 14, 1976.
- 2/ Ibid.
- 3/ EIA, Draft NEIS Development Plan, November 1, 1978, Appendix 7, p. 3.
- 4/ Ibid., Appendix 7, pp. 3-4.
- 5/ Logistics Management Institute, National Energy Information System: Detailed Conceptual Design, May 1978.
- 6/ EIA, Draft NEIS Development Plan, November 1, 1978, Appendix 7.
- 7/ Memo from Albert H. Linden, Jr., Assistant Administrator, Office of Energy Data, EIA, for Lincoln Moses, Administrator, EIA concerning a system concept for the National Energy Information System, October 11, 1978.
- 8/ Memo from Lincoln E. Moses, Administrator, EIA, for Albert H. Linden, Jr., Assistant Administrator, Office of Energy Data, EIA, concerning a system concept for the National Energy Information System, October 24, 1978.
- 9/ EIA, Draft NEIS Development Plan, November 1, 1978.
- 10/ Statement of an official, Office of Policy and Evaluation, EIA, personal interview, April 5, 1979.
- 11/ Statement of an official, Office of Planning and Evaluation, EIA, personal interview, March 30, 1979.
- 12/ Based on staff examination of the Office of Energy Information Services activities.
- 13/ Memo from John E. Daniels, Director, Office of Energy Information Services, EIA, to PART staff, February 6, 1979.
- 14/ EIA, Annual Report to Congress 1978, Volume One, (Washington: 1979), p. 1.
- 15/ Ibid., p. 38.

CHAPTER 5

STATUS OF EFFORTS TO IMPROVE THE CREDIBILITY OF ENERGY MODELS

The Energy Conservation and Production Act of 1976 1/ and the Department of Energy Organization Act of 1977 2/ requires that EIA develop and maintain a capability for forecasting and analyzing short- and long-term relationships between energy supply and consumption and appropriate variables. EIA must also develop, evaluate, and maintain energy flow and accounting models describing the production, distribution, and consumption of energy by the various sectors of the economy and lines of commerce in the energy industry. These capabilities are used to forecast and analyze energy consumption, production and price trends under various assumptions and to project the effects of energy-related events on the economy, on particular consumer groups, and on the environment. 3/

PROGRAM PLAN FOR OFFICE OF APPLIED ANALYSIS

EIA prepared a program plan for the Office of Applied Analysis in August 1978. The plan lays out, in a unified, comprehensive, and detailed fashion, the overall mission, ongoing functions, and measurable objectives of that office for fiscal years 1978 through 1981. The Office of Applied Analysis intends to use the plan as a management tool for planning the direction of program objectives and projects, tracking estimated timeframes, and managing resources. 4/

An Analysis Oversight and Access unit has been established within the Office of Applied Analysis to develop and conduct programs which establish and enhance the quality and accessibility of EIA's analytical tools and products. Among the projects in the plan are the development of standards and procedures for documentation of analyses and models, development of standards and procedures for access to models and analyses, development and implementation of a program for simplifying and automating model operating systems to make models transferable to non-DOE users, and development of a program to monitor compliance with standards and procedures for the technical review and oversight of Applied Analysis products. All other offices in Applied Analysis have as a priority project the development of documentation for their models. 5/

We believe the development of a program plan for the Office of Applied Analysis was an essential first step. However, the plan was not completed until August 1978; therefore, an insufficient period of time

has elapsed to evaluate the Office's activities in relation to objectives or standards set forth in the program plan.

PROCEDURES AND PRACTICES
FOR MODEL BUILDING

To fulfill the intent of the Congress, we believe that EIA must establish the credibility of its mathematical and statistical models. In the 1977 PART report, we suggested the following procedures and practices as essential to building an acceptable level of credibility into EIA modeling activities.

1. Public Participation and Professional Review -- Outside professionals should be involved in the development and maintenance of a model, thus guaranteeing its widespread acceptance and credibility. Such involvement should include, procedures that allow (1) internal and outside experts to participate in determining, updating, and refining major changes in assumptions and structure and (2) the general public to review and comment on the model's assumptions and structure.

2. Control over Model Changes -- A systematic procedure should exist that specifies what, when, and why changes should be made to the model and who should make them. This should take the form of a timetable for selected changes, a public list of individuals responsible for making changes, and a schedule of regular and planned uses of the model.

3. Documentation -- During the design, development, and maintenance of a computer model, its purpose, methodology, assumptions, capabilities, and limitations must be recorded and explained. An adequately documented model permits outside parties to use and understand it, evaluate its credibility, and participate in its development.

4. Verification -- To achieve credibility, a model's mathematical calculations should be checked for accuracy. Also, its structure and relationships should be verified against the system it is trying to represent.

5. Validation -- A model's predictions should be compared with actual data to determine the probability of error in forecasts. This should be done on a regular basis with the results made available to the public.

6. Sensitivity Testing -- The extent that a model responds to changes in assumptions, specifications, and data should be measured. Again, the results of such tests should be made public. 6/

ADVISORY
COMMITTEE

PART, in its 1977 Annual Report on the Office of Energy Information and Analysis, suggested the creation of a group of experts to review and monitor the basic premises of and proposed changes to the energy models. A group consisting of energy, economic, and modeling experts from other Federal agencies, State agencies, industry, and academia could pass on the overall integrity of models, the appropriateness of changes, and the adequacy of the documentation, verification, validation, and testing practices employed by the Energy Information Administration. The work of such a group would not only enhance the credibility of the models to the professionals who use them, but would also increase the public's confidence in the products generated by the models. 7/

The Secretary of Energy, in his comments on the 1977 PART Annual Report, said that planning was underway to establish EIA advisory panels on (1) data systems design, (2) data validation, and (3) modeling. 8/

EIA started work in November 1977 to establish three advisory committees which would have a broader spectrum than those stated in the Secretary's comments. The proposed committees were for

- data collection and systems development,
- data validation, and
- energy modeling and forecasting.

The initial work to establish these committees was halted because EIA officials decided it was better to wait for the Administrator, who was to come on board in January 1978. Revisions were made to the original work after the Administrator arrived and the proposal was submitted to Dr. Schlesinger on March 14, 1978. Dr. Schlesinger rejected the proposal to establish three committees and suggested EIA form one committee with three subcommittees—one for each area of expertise. Under the Advisory Committee Act, this actually meant the setting up of four committees instead of the original three intended.

In May 1978, EIA proposed only one committee called an Advisory Council. It was to consist of 36 members and be informally split into at least three committees. This was subsequently withdrawn from active consideration. The Administrator of EIA chose instead to propose a Government established advisory committee to be made up of representatives of the American Statistical Association. His view was that, since EIA is a statistical agency like the Bureau of Census, it should follow

the advisory committee structure that Census uses. This proposal was forwarded to the DOE General Counsel on July 3, 1978. The General Counsel disapproved this proposal because the committee did not appear to be balanced—that is, consisting of representatives of State Governments, consumer groups, utilities, etc.

In October 1978, the Administrator of EIA suggested that EIA should find a committee already established and utilize that committee. The American Statistical Association had formed in August 1978 an Ad Hoc Committee on Energy Statistics which EIA could utilize. DOE's General Counsel cleared this arrangement and approved paying the members travel and per diem expenses when meeting on EIA business. 9/ The first meeting of the committee will be in May 1979. The committee will be composed of 16 members and designed to offer advise about programs of EIA. 10/

CONTROL OVER MODEL CHANGES

EIA generally makes changes to its models on the basis of

- regular data updates,
- accommodating special analytical requests that necessitate changes to model characteristics, and/or
- structural improvements.

According to EIA officials, in all cases of permanent modifications or replacement of EIA's models, authorization is given by the appropriate division chief and his supervisor[s]. The actual changes are then made by the principal analyst responsible for operating the particular model that is to be changed or replaced. Changes due to regular data updates and structural improvements are authorized generally on an annual basis while changes due to a special use of a model are authorized on an as-needed basis, usually determined by the flow of assignments. EIA procedures call for new models to be reviewed, usually by the Assistant Administrators, before their use in analysis is authorized. Model development plans and priorities should be determined by the Assistant Administrator, the Deputy Assistant Administrator, office directors and division chiefs as part of EIA's planning process. The Office of Analysis Oversight and Access is responsible for preparing annual reports outlining modeling needs of Applied Analysis based upon anticipated future energy issues.

EIA currently does not have a list of people responsible for making changes to models available to the public. Work is in process on the development of a set of summaries for all EIA models which will include the name of the principal analyst responsible for each model.

EIA intends that versions of models used to make projections contained in the National Energy Plans, the Administrator's Annual Reports, and other major versions of models will be archived by the National Energy Software Center at the Argonne National Laboratory. The Office of Analysis Oversight and Access is determining the issues and expense of archiving the models with the National Energy Software Center. Currently, EIA is instituting a system of model serialization which will identify model versions utilized in the preparation of published reports. The origin of the serials for a given year will be for those versions of the model used in preparation of the Administrator's Annual Report. 11/

DOCUMENTATION OF MODELS

This year, EIA has emphasized more complete documentation of its models. It developed interim model documentation standards in October 1978 to insure the uniformity of EIA's model documentation. 12/ In our judgement, the interim standards represent a positive action designed to enhance the credibility of EIA's computer models. EIA intends for all newly developed models to be documented as called for by the interim standards. EIA's immediate goal is to document all models used in the development of forecasts and other analyses published in the Administrator's 1978 Annual Report.

EIA Interim Documen- tation Standards

EIA is requiring the following five documents to be developed for all models.

1. Model Summary -- A short, one to two page, nontechnical description of the model. These summaries describe the model's role and usefulness in DOE analyses, its general structure including inputs needed and answers produced, its relationship to other models, and finally, the status of any ongoing enhancements or model development. These summaries are used to provide general information about the modeling activities of EIA.

2. Model Description -- A statement of the equations and other procedures which constitute the formal model structure, a description of the data and other information utilized in developing the model structure, statistical characteristics of estimated portions of the model, and any other information necessary to an understanding of what the model is and how results derived from the model are obtained.

3. Guide to Model Application -- A nontechnical description of how to use a model for analysis or forecasting, how to specify alternative input assumptions and data, and how to interpret model output. These guides are aimed at those who plan to use a model to investigate a particular energy-related issue, but who will not necessarily be actually operating the model on the DOE computer.

4. Methodology Description -- A technical document which represents a complete description of a model's rationale, precedent for the model in the literature, and comparison to other similar models or approaches. This level of documentation details the capabilities of the model as well as its assumptions and limitation. The basic purpose of this documentation is to explain why the model structure chosen was selected and to communicate how the model compares to and was chosen over alternatives.

5. User's Guide -- This constitutes a detailed description of a model's operating procedures including names and locations of input files and computer programs, naming conventions, and required job control statements. These documents are intended for the use of EIA staff who actually operate the model on the computer and should enable an informed staff member to make model runs and label his input files and output files, so that subsequent users will be able to properly identify the files. An annotated listing of the computer program should be an appendix to the operating documentation. This documentation category will require frequent revision to be kept current. 13/

As of February 1979, all EIA model development and procurement actions have had to stipulate that the contractor will prepare documentation in compliance with EIA's interim standards. Contractual efforts underway are being reviewed and deficiencies in documentation are being identified. If they are found not to be in compliance with the interim standards, amendments to the contract will be prepared and implemented.

The existing documentation of operational models to be utilized for the 1978 Administrator's Annual Report was reviewed. Each office prepared a report identifying existing documentation and documentation deficiencies. For deficiencies, the report presented a schedule of activities designed to prepare the required documentation by the end of 1979.

MODEL VALIDATION PROCEDURE
DEVELOPMENT EFFORTS FOR
MODEL ASSESSMENT

The Office of Analysis Oversight and Access under the Assistant Administrator of Applied Analysis is currently sponsoring model validation procedure development efforts for model assessment. This will be done under three ongoing contracts and three proposed contracts.

The National Bureau of Standards has been awarded a contract in the amount of \$225,000 to focus on the oil and gas supply model emphasizing code verification and results assessment.

The Los Alamos Scientific Laboratory has been awarded a contract at the rate of \$60,000 a year. Their work will focus on the electricity supply model with an emphasis on assessing the model's results and the associated "confidence" that may be placed upon alternative uses.

The Massachusetts Institute of Technology Energy Laboratory has been awarded a contract at the rate of \$100,000 a year. Their work will focus on coal supply with an emphasis on auditing the models computer implementation to determine if the concept structure claimed is in fact present and assessing model results to determine credibility.

Two contracts have been proposed for Brookhaven National Laboratory, one, at the rate of \$420,000 a year, which will focus on the economy and energy system interactions with an emphasis on assessing model characteristics to reveal the "confidence" which may be assumed in the models results. This includes an explicit examination of the models structure, the quality and coverage of the input data, and the sensitivity of the results given the structure and data as compared to available alternatives. Another contract, at the rate of \$150,000 a year, will focus on industrial energy use process models with an emphasis on assessing the "confidence" in model results to determine the extent they may be considered credible. A contract is in preparation for the Lawrence Berkeley Laboratory which will focus on econometric demand modeling and residential and commercial modeling with emphasis on assessing the characteristics of the models to determine the extent of confidence that may be placed in a models performance.

Each of the contracts or proposed contracts will explicitly consider verification, validation, and sensitivity testing of models, along with portability, accessibility, and documentation of models.

Preliminary standards, procedures, and guidelines should be completed in 1979. Final ones should be completed in 1980. 14/

EIA'S IN-HOUSE ACTIVITY ON
MODEL VALIDATION, VERIFICA-
TION, AND SENSITIVITY TESTING

PART believes EIA must establish the credibility of mathematical and statistical models used in analyses and forecasts. To do this, it must perform verification, validation, and sensitivity testing of each model. Some verification of the mathematical computations in models has been done. An inspection of computer codes is conducted by the EIA analysis group responsible for a model at the time of its initial implementation and upon its use in analyses. Such checks using control totals or testing the models production of fitted (input) results are also utilized by EIA. Moreover, the Office of Analysis Oversight and Access is undertaking in-house projects to develop software which will enable the ready inspection of the relationship structure and other attributes of large, complex computer models.

However, EIA has not attempted in-house validation of its models. Most of EIA's forecasts were made for time periods beyond 1980, therefore, it has not been possible to compare the forecasts with actual data to determine the probability of error in the forecasts. EIA's policy has been not to produce "point" forecasts, but, instead, to produce forecast ranges representing the uncertainty inherent in the forecast results. 15/

PUBLIC ACCESS
TO EIA MODELS

The Energy Conservation and Production Act required EIA's predecessor agency, the Office of Energy Information and Analysis to permit access to the Project Independence Evaluation System, a forecasting system since replaced by EIA. Fair and reasonable fees may be charged for Project Independence Evaluation System access. 16/

The Office of Energy Information and Analysis initiated a study performed by a contractor, Logistics Management Institute which submitted its final report to EIA in March 1978. 17/ The contractor was to consider alternative options for public access to the Project Independence Evaluation System and the resource implications of implementing the alternatives. Although this work was focused on the Project Independence Evaluation System, much of it can be applied to access any model. Logistics Management Institute developed three alternatives for access to models.

1. The use of the models by EIA staff at the request of others.
2. The provision of sufficient materials and support to enable an EIA model to be established on another's computer facility (model portability).
3. The provision of sufficient materials and support to enable another to run a model on the DOE computer. 18/

Due to resource constraints, EIA is currently undertaking projects to enable access under the first two conditions. No efforts are underway to enable others to run models on the DOE computer. 19/

EIA has performed numerous studies and analyses utilizing EIA models at the requests of the executive branch and Congress. EIA is presently investigating the requirements for transmitting its models to the National Energy Software Center at the Argonne National Laboratory. EIA's goal is to prepare sufficient model documentation to enable the software center to establish operating versions of EIA models on their systems, serve as a distribution point, and provide technical assistance for distributing the models to others. If an arrangement with the software center is successfully implemented, EIA models will be generally available (portable) through the center to the public.

The costs of access to the models will be borne by the requestor consistent with the subscription practices of the software center. Pilot projects with the software center including the oil, gas, coal, electricity supply modules, and the integrating logic of the EIA mid-term forecasting system, are scheduled for completion this fiscal year. 20/

CONCLUSION

During 1978, EIA has taken various actions to improve the credibility of its energy models. PART believes that the development of a program plan for Applied Analysis and interim documentation standards are a major step in the right direction. EIA is also establishing controls over model changes, and it is sponsoring development of a model validation procedure, development efforts for model assessment which encompass validation, verification, and sensitivity testing procedures for models. It is also establishing procedures for public access to its models.

EIA has established an ad hoc Committee on Energy Statistics. Although the charter for this committee has not been established, PART has two concerns. First, the ad hoc nature connotes a special

purpose, short duration, committee which would not satisfy what PART perceives to be EIA's needs for a standing committee to provide ongoing technical advice. Second, it is unclear to what extent the ad hoc committee will represent the various interest groups as required by the Federal Energy Administration Act. PART believes the ad hoc committee may be helpful to EIA, but it is not the type of committee that PART envisioned to be of maximum benefit to EIA. PART plans to monitor and evaluate its effectiveness in the coming year.

FOOTNOTE REFERENCES

- 1/ Public Law 94-385, August 14, 1976.
- 2/ Public Law 95-91, August 4, 1977.
- 3/ EIA organizational charts and mission and function statements.
- 4/ Energy Applied Analysis Program Plan, fiscal years 1978-1981, fiscal year 1978 version prepared by the Office of Planning and Evaluation, EIA, August 1978.
- 5/ Ibid.
- 6/ PART, Activities of the Office of Energy Information and Analysis, Washington, D.C., December 5, 1977, pp. 33-34.
- 7/ PART, Activities of the Office of Energy Information and Analysis, Washington, D.C., December 5, 1977, pp. 42-43.
- 8/ James R. Schlesinger, Secretary of Energy, November 7, 1977, letter to Richard W. Kelley, Chairman, PART.
- 9/ Statement of an official, Office of Planning and Evaluation, EIA, personal interview, January 14, 1979.
- 10/ Statement of an official, Office of Planning and Evaluation, EIA, telephone interview, March 20, 1979.
- 11/ Lincoln E. Moses, Administrator, EIA, December 12, 1978, letter to Richard W. Kelley, Chairman, PART.
- 12/ Memo from George M. Lady, Director, Office of Analysis Oversight and Access, EIA, through C. Roger Glassey, Assistant Administrator, Office of Applied Analysis, EIA, to David Hulett, Kenneth Kincel, David Montgomery, Howard Walton setting up interim model documentation standards, October 23, 1978.
- 13/ Ibid.
- 14/ Lincoln E. Moses, Administrator, EIA, December 12, 1978, letter to Richard W. Kelley, Chairman, PART.
- 15/ Ibid.

- 16/ Public Law 94-385, (sec. 113 and 31[3]).
- 17/ Logistics Management Institute, Recommendations for PIES Access, March 1978.
- 18/ Ibid.
- 19/ Lincoln E. Moses, Administrator, EIA, December 13, 1978, letter to Richard W. Kelley, Chairman, PART.
- 20/ Ibid.



Department of Energy
Washington, D.C. 20461

April 12, 1979

Mr. Richard W. Kelly
Chairman, Professional Audit Review Team
441 G Street, N. W.
Washington, D. C. 20548

Dear Mr. Kelly:

Thank you for the opportunity to respond in writing to the observations made in Draft of a Proposed Report: Report on the Activities of the Energy Information Administration, Department of Energy prepared by the Professional Audit Review Team (PART). The draft report discusses the activities of EIA in four major areas. They are (1) independence from energy policy functions, (2) procedures and plans for the validation of energy information, (3) efforts to develop a National Energy Information System, and (4) the integrity of energy modelling activities. We found the report to be, generally, a fair assessment of EIA's activities during its first full year of existence. However, certain of the conclusions and recommendations relating to the major areas of PART's observations merit comment.

Independence From Energy Policy Functions

In the course of the past year we have gone to great lengths to establish and follow procedures to promote objectivity and independence in the course of our analytical work. Thus, I am pleased with PART's conclusion that EIA analytical efforts are independent of energy policy influences. However, I am concerned with the PART suggestion "that EIA has a responsibility to publicly announce the nature and extent it has provided input to significant DOE policy decisions and also to publicly comment on the professional quality of the analytical products used in significant policy decisions that were acquired from sources other than EIA."

With respect to EIA support to DOE policy decisions, we agree that EIA should make clear the nature and extent of its contribution. Our current policy of publishing all the work we do for others, with complete documentation of the nature and source of the request, does exactly that. Additionally, since all of EIA's analytic work is documented and published, its credibility or neutrality should not be damaged by the existence of other analytic studies. On the contrary, we feel that our openness in documenting EIA analyses leads to more openness and intellectual objectivity on the part of other analytic organizations.

With respect to commenting on the analytical products of others, I do not feel it is a proper part of EIA's role to be a critic of all types of analyses emanating from the Department. While Congress established EIA to provide independent, credible energy analysis, no monopoly over analysis is required of the EIA; nor do I believe this to be the Congressional intent. Although we often review the analytical products of others, either at our own initiative or at the request of others, I do not believe that EIA should set itself up as the final authority on analytical results, particularly where legitimate uncertainties and differences of opinion naturally exist. I might add that our analytic resources are already stretched to the full; a general refereeing role would be physically impossible within our personnel resources. ^{1/}

Finally, the observation that EIA cannot always respond to requests for analytical support from the Department's Office of Policy and Evaluation in a timely manner has merit. Often, responsiveness, which generally calls for speed, and objectivity, which usually calls for deliberateness, can be in tension with each other. In such instances, we shall continue to favor objectivity with the attendant requirements for definiteness and specificity of parameters, assumptions, and methodologies.

Validation of Energy Information

The draft report concludes that "little progress has been made in the actual assessment of the accuracy and reliability of energy data." This conclusion appears to be based in large part on a review of activities relating to contracting efforts to perform pilot validation studies of existing systems in the search for effective validation methodology. During 1978, validation activities encompassed a great deal more than the pilot validation of existing systems.

PART NOTE: ^{1/} PART agrees with Dr. Moses' position and has deleted this suggestion from the report.

In its first year of existence the Validation Office made substantial progress, with a small staff, in areas which we identified early in 1978 as those requiring immediate attention. These include: (1) establishing and staffing a working organization; (2) developing validation methodology; (3) reviewing 130 proposals for new or revised data collection forms, which resulted in technical improvements in the final forms and survey plans; (4) assisting in the development of the Oil and Gas Information System to improve the system's design prior to implementation; and (5) conducting in-house analyses of information requirements, such as in support of the Economic Regulatory Administration and Federal Energy Regulatory Commission efforts prior to implementation of the National Energy Act. The primary objective was to carry out critical reviews of new or revised systems and forms prior to their implementation, since it is far less disruptive in the short-term and far more effective in the long-term to correct problems prior to implementation rather than after.

The pilot studies did not progress as well as had been hoped, which is indicative of the difficulty involved in developing validation methodology. With the methodology development now well advanced, we expect final validation reports on six systems to be completed over the course of the year. The other eight systems have been folded into four broader requirements studies, two of which will be completed this year and two in 1980.

The draft report attributes the slow progress in completing the validation studies in 1978 to the lack of a clearly defined mission statement and program plan. While a formal multi-year program plan did not exist until February, 1979, the short-term objectives of the program enumerated above were well understood and generally accomplished. The construction of a multi-year program plan awaited the development of validation methodology and budget guidance on the level of resources which would be available for the validation effort. During the budget formulation process, funding options for the validation program ranged from \$7 million to \$30 million annually. The Secretary has followed through on his commitment, made in his response to last year's PART Report, to provide adequate resources for the validation program. Currently pending before Congress are an FY 1979 supplemental request for \$4.1 million (for a total of \$10.9 million in FY 1979) and an FY 1980 request for \$15.9 million. 2/

PART NOTE: 2/ The lack of tangible results in the way of completed validation reports or evidence that a satisfactory data validation methodology was being developed leads the PART to the conclusion that little progress has been made in the actual assessment of the accuracy and reliability of energy data.

National Energy Information System

The draft report concludes that "only limited progress has been made in developing the National Energy Information System" (NEIS) and further recommends that "Congress clarify its intentions" because "EIA is confused about what the legislation requires." It is true that the NEIS has been slow to take form. But the delay has resulted from its complexity and from the desire to find an adequate response, not from confusion regarding the intent of the legislation. The legislation is clear: we are to establish a base of energy information sufficient to define and permit the analysis of a stated range of energy information issues.

In August of last year, I identified questions which, when answered, would go a long way toward accomplishing the job of establishing an NEIS. These questions address what information should be in NEIS, and how shall the information be collected, stored, classified and indexed, accessed, and reported. Since that time, substantial progress has been made in addressing these questions. A task force has considered and prepared a report proposing how to describe, classify, index, and locate elements of energy information. A procurement request to begin this work will be forwarded later this month. Recent accomplishments in dissemination, such as a catalog of EIA publications, rationalization of mailing lists, and publications indexing, prepare favorable ground for the NEIS. How best to collect information is being addressed in the forms review and clearance process. The information requirements studies being conducted as part of the validation effort will assist in determining what information should be in NEIS. Three major NEIS destined programs are advancing steadily: the Consumption Survey, the Financial Reporting System, and the Oil and Gas Information System.

These activities may have appeared rather disparate because there has not been an organizational locus for the NEIS. While I do not consider the EIA organization to be synonymous with NEIS, many of the tasks involved in establishing the NEIS are on-going parts of much of the organization. Organizational and personnel changes now seem ready to jell. The foregoing considerations indicate imminent material progress on NEIS. It appears wise to allow their form to unfold rather than to seek more specific legislative guidance at this time.^{3/}

PART NOTE: ^{3/} PART still believes that a clarification of the legislation would be useful to EIA in designing and implementing a National Energy Information System which will satisfy the needs of Congress, executive agencies and the public.

Energy Modelling Activities

I am pleased with the draft report's assessment of the progress we have made in improving the credibility of energy models. I agree with the importance that PART attaches to the outside professional review of our models. EIA's program of model review and assessment provides a vehicle for obtaining such views. Comments are sought from professionals in the academic and consulting community on current model strengths and weaknesses and on the direction of future change. Moreover, it is our policy to use the specialized expertise of outside contractors to assist EIA staff in model development and maintenance. Since model and analysis documentation is publicly available, the interested public are free to review and comment as they wish; indeed, we welcome such comments. These processes afford us the kind of impartial expert considerations with which PART is so justly concerned.

Advisory Committee

With respect to non-government advice about EIA programs, the EIA is fortunate to be able to draw upon the expertise of the members of the Ad Hoc Committee on Energy Statistics of the American Statistical Association. The 16 members of the Committee represent a wide variety of backgrounds, experience, knowledge, and technical expertise. These individuals are well qualified to offer advice about the programs of the EIA, including modelling and forecasting. In fact, some of the types of problems with which the Committee will be concerned, as stated by the ASA Executive Director, include the design of energy accounts within a consistent framework, the improvement of particular forecasting and analytic models, the character of an energy management information system, and the efficiency of various survey methods. The initial goal of establishing a mechanism to receive advice from outside experts is now established and I fully expect all of the programs of the EIA to benefit, over time, as a result.^{4/}

PART NOTE: ^{4/} Although the charter has not been established for the Ad Hoc Committee on Energy Statistics, PART has two concerns. First, the ad hoc nature connotes a special purpose, short duration committee which would not satisfy what PART perceives to be what EIA needs for a standing committee to provide ongoing technical advice. Second, it is unclear to what extent the ad hoc committee will represent the various interest groups as required by the Federal Energy Administration Act. The PART believes the ad hoc committee may turn out to be helpful to EIA, but it is not the type of committee that PART envisioned would be of maximum benefit. PART plans to monitor and evaluate its effectiveness in the coming year.

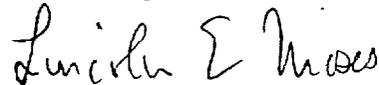
EIA's First Year

It is true that there were changes in the senior management of EIA during the last year. Some delay was experienced; in part this resulted from preferring excellence to promptness in filling key positions. We expect greater stability in the senior management during the next year. All of the key Assistant Administrators are now in place and the search for a new Deputy is progressing well. I am also pleased to announce that I will remain on as the Administrator until July or August, 1980.

PART's overall assessment that "EIA is making progress toward improving the quality and reliability of Federal energy data and analysis" but that "much more needs to be done before EIA fulfills its congressionally mandated charter" is a fair one, and one that underlies our long-range planning. Significant tasks surely remain in moving toward establishing a comprehensive, reliable base of energy information. Much of the agenda for the years to come has been established by programs initiated in 1978. Most important, during 1978 I believe much has been done to set the tone for the production of high quality statistical and analytical products and for the exercise of impartial professional judgement.

Thank you again for the opportunity to comment on the observations presented in the draft report. I greatly appreciate the valuable work of the Professional Audit Review Team in identifying those areas of the EIA operation which require more attention. Again this year, as I stated last year, we will use the findings of the PART report to help inform our work agenda for the upcoming year.

Sincerely,



Lincoln E. Moses
Administrator
Energy Information Administration



Lawrence Berkeley Laboratory

University of California
Berkeley, California 94720
Telephone 415/486-4000
FTS: 451-4000

March 27, 1979
ADA 79-92

Mr. Richard W. Kelley, Chairman
Professional Audit Review Team
441 G Street N.W.
Washington DC 20548

Dear Mr. Kelly:

Dr. Sessler has asked that I reply to your letter regarding the Professional Audit Review Team (PART) proposed audit report. Since your letter was only received on March 22, 1979, the time available for meeting your deadline date of March 28, 1979 is very short.

The Laboratory is not in agreement with the negative statements made by OEIV officials in the draft audit report. The project was initially started in the winter of 1978 at a modest level of activity. In June-July, discussions by Office of Energy Information Validation (OEIV) officials with LBL staff resulted in a significant expansion of activity for FY 1978 and an even greater expansion for FY 1979. Validation officials repeatedly urged a buildup of activity which was in fact akin to a "crash" basis. To initiate a program activity in mid-year at the \$380,000 level and expand it to a \$6,000,000 level within a year is a tremendous undertaking. Inherent in such a buildup, there is less than optimum efficiencies of operations. The Laboratory's actions were consistent with the rapid buildup requested by OEIV, and resulted in the establishment of a large staff for the program. The sudden termination of the program was caused by the absence of sufficient funds at OEIV, contrary to our understanding of the situation. I am enclosing my letter of January 18, 1979 to Dr. Moses which sets forth in more detail some of the circumstances involved in the project. You might find this information useful for presenting a more complete view of the project.

The Laboratory is appreciative of the opportunity to respond to your draft report.

Sincerely,

George L. Pappas
Associate Director for Administration

GLP:af


 APPENDIX II
 Lawrence Berkeley Laboratory

 University of California
 Berkeley, California 94720
 Telephone 415/843-2740

 18 January 1979
 ADA 79-25

Dr. Lincoln Moses
 Administrator
 Office of Energy Information Validation
 Energy Information Administration
 Department of Energy
 Room 4311 - 12th & Pennsylvania, N.W.
 Washington, D.C. 20461

SUBJECT: PHASEOUT OF LBL'S OEIV PROJECT

Dear Dr. Moses:

On 2 January 1979, John Shewmaker and Charles Shirkey of Charles Smith's staff advised me that LBL's OEIV Project, "Comprehensive Validation Studies of Selected Energy Information Systems", was to be phased out as soon as possible with target date of 31 January 1979, due to the lack of funds in OEIV to continue the project.

The Laboratory immediately took the following actions: layoff notices were given to 42 employees, all consultants were advised in writing that their services were terminated, all Personal Service Contracts were terminated, Pragmatica was advised in writing that its contract would not be renewed upon its expiration date of 10 January 1979, the Institute of Policy Analysis was advised to shut down its work for LBL, and various other actions to reduce or to stop cost incurrence by the project. The estimated total cost for the project is 1,090K\$. Costs reported through 31 December 1978 were 837.2K\$. The estimated costs to be incurred compared to our financial plan and additional funding required to cover costs are set forth in the following table:

<u>Current</u> <u>Fin. Plan</u> (K\$)	<u>Total</u> <u>Est. Costs</u> <u>of Project</u> (K\$)	<u>Additional</u> <u>Funding</u> <u>Required</u> (K\$)
1,000	1,090	+ 90

The monthly costs incurred by month by major category of expense are as follows:

Dr. Lincoln Moses
 Administrator
 Office of Energy Information Validation
 18 January 1979 ADA 79-25
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<u>Type of Expense</u>	<u>Actual</u>			<u>Estimated</u>	
	<u>Oct.</u>	<u>Nov.</u>	<u>Dec.</u>	<u>Jan.</u>	<u>TOTAL</u>
a. Wage Expense	62.6	83.5	70.8	63.0	279.9
b. Travel, procurement consultants, etc.	8.3	96.4	161.9	154.8	421.4
c. Subcontract (Institute for Policy Analysis)	-0-	25.3	27.4	42.5	95.2
d. TOTAL DIRECT	70.9	205.2	260.1	260.3	796.5
e. INDIRECT (40.5% of a+b)	28.7	72.9	94.2	88.2	284.0
f. Special Procurement Rate (10% of (c))	--	2.5	2.7	4.3	9.5
TOTAL COSTS	99.6	280.6	357.0	352.8	1090.0

The Laboratory's indirect cost rate is projected to be 40.5%; the rate for the first three months of the fiscal year is 47.3%. Since we are still projecting a rate of 40.5%, the indirect costs shown above reflect our projected overhead rate. The costs reported through DOE's Financial Information System reflect actual rate to date and consequently FIS reported costs for the first quarter are somewhat higher. A more detailed presentation of costs is reflected in the attached accounting report for the months of October through December 1978. (Please refer to attached Appendix D).

The Laboratory was closed during the period 23 December 1978 through 1 January 1979, accounting for the decrease in wage expense for the month. Consultant and subcontract costs shown for January reflect delayed billing and estimated costs for the Institute of Policy Analysis for January, and for maintaining graduate students through 31 January 1979. Also, employees receiving layoff notices were given either two weeks notice or four weeks notice in accordance with University policy.

In reference to Mr. Shirkey's letter of 7 January 1979, to me, he set forth five minimal tasks to be completed by 31 January 1979. In brief, these are as follows:

1. Complete transfer of work to date on the five systems.
2. Files on Kindle studies returned.
3. Computer files identified.

Dr. Lincoln Moses
Administrator
Office of Energy Information Validation
18 January 1979 ADA 79-25
Page Three

4. Copies of questionnaires, names of interviewees, and dates interviewed to be transmitted to OEIV.
5. Data analysis working paper.

The first four items will be accomplished within the termination costs set out above in the following manner:

1. Transfer of work to date on the five systems:

- a. For each of the five system studies and FRS, a set of documents will be provided. A list (not an index) of the documents within each set will also be provided. Samples of such lists are shown in Appendix A.
- b. A set of official project files will be provided. Included will be official correspondence and monthly cost statements.
- c. The project's library books, library index and a project bibliography will be furnished.

As noted above, these materials will be provided to EIA within the termination costs. If fuller documentation or indexing is desired by EIA, LBL must work out with EIA operational definitions of "documented fully" and "annotated as needed" (terms used in Mr. Shirkey's letter). LBL would be glad to have Mark Horovitz meet with anyone who EIA designates to develop such definitions, and we will then provide an estimate of associated costs. However, the terms are so ambiguous as presented in the letter as to preclude a definitive estimate at this time. The sooner we can start on these definitions, the lower the costs will be, since the project personnel are now dispersing and their services may no longer be available.

2. Files on Kindle studies:

The files on the Kindle studies which are now at LBL will be returned. Due to the hasty termination of project personnel, such as consultants, a small number of the documents are still in the hands of these individuals who are no longer associated with LBL. It is intended to put the existing documents in order and close the files in their present condition. Meanwhile, efforts are being made to locate and retrieve missing documents. These will be returned to OEIV when they become available.

Dr. Lincoln Moses
Administrator
Office of Energy Information Validation
18 January 1979 ADA 79-25
Page Four

3. Computer Files:

A list (not an index) of the project's computer files, located in the OSI-EIA computer, will be provided, ordered by study and individual. We recommend that these files be disposed of by copying them onto magnetic tape. No printout of these files is recommended at this time. A copy of the project's EIA computer use forms will be provided.

4. Field Surveys:

For each survey, a blank questionnaire and a list of companies or institutions interviewed will be provided together with the corresponding dates. Any materials that would identify the specific individuals interviewed or proprietary or other restricted information will be destroyed. In accordance with the policy and procedure established by Mr. Shewmaker, no field notes will be submitted to EIA.

The fifth task, the working paper on data analysis, will require additional time and funds to accomplish. To do this, we propose to recall each of the study managers for a period of one week. They would work with Drs. Mark Horowitz and Jon Golovin, to produce five working papers, one on each system. These papers would comment on the rationale, methods, findings and recommendations for future work on data analysis for each study. Performance of this task is contingent on the availability and willingness of personnel to carry out such work. The estimated cost for this work is 20K\$. Mr. Shirkey also included a paragraph on "non-essential, nice-to-have tasks". These were discussed with him when he was here on 3 January. A list of such studies was transmitted to him via telecopier on 16 January 1979, and personnel costs (without overhead or other supporting costs such as secretarial help, phones, photocopying, etc) were shown on that document. Attached as Appendix B is the same list, showing the same direct personnel costs. Added in each case is the total cost, including the items cited above. These further refine an updating estimate telecopied to Mr. Shirkey on 16 January 1979. If you wish to have either the fifth task or any of the "non-essential" tasks undertaken, please advise me at once in writing, accompanied by a TWX from the Controller of DOE via SAN, transmitting funds for LBL's financial plan.

The information that Messrs. Shewmaker and Shirkey conveyed in our discussions of 2 January and 3 January regarding the non-availability of additional funds was most disturbing. The fact that the agreed-upon additional funding of 2,600K\$ would not be forthcoming was unexpected, and the further fact that OEIV never had the financial resources in its own financial

Dr. Lincoln Moses
Administrator
Office of Energy Information Validation
18 January 1979 ADA 79-25
Page Five

plan to fulfill this promise to LBL was shocking to us. I attach hereto as Appendix C a copy of the letter from Mr. Smith to Mr. La Grone, dated 30 October 1978, advising that "another \$2,600,000 has been approved and will be released later this year. This funding action has been concurred in both by the EIA Financial Officer and the Office of the Controller, as indicated below." Mr. Smith's plans were predicated on receiving 15,000K\$ in supplemental funds from the Congress, which will not be forthcoming since the Office of Management and Budget did not approve Mr. Smith's funding request. Instead, OMB approved additional funding of 4,000K\$ to become available on 1 June 1979. It was a complete surprise to learn that Mr. Smith's office does not have the 2,600K\$ to complete the funding of the 189 Project form which was approved by Mr. Smith at our meeting in October 1978. Mr. Smith verbally approved the 189 Form with a few minor exceptions which were corrected very shortly thereafter. In response to my question whether Mr. Smith had in hand the necessary 2,600K\$ to increase our funding from the 1,000K\$ to 3,600K\$, Mr. Smith responded affirmatively. Mr. Smith further indicated that the supplemental funding was needed, however, for the proposed second 189 Form to provide an additional 2,400K\$ for a total funding of 6,000K\$. Mr. Smith repeatedly stressed that LBL should be hiring more staff at a more rapid rate and not to be concerned about the follow on funding of 2,600K\$.

Based on these assurances from Mr. Smith, the Laboratory continued and accelerated its recruitment of personnel predicated on a 6,000K\$ program for FY 1979. This required building a broad base of operations to involve about 120 people plus a number of consultants. This staff was needed to validate the nine information systems specified in the Project 189 Form. Considerable effort was devoted to this rapid buildup of staff and, at the same time, to working on the nine energy information systems.

On 16 January 1979, I transmitted to Mr. Shirkey a progress report for December and part of January, referring to the completion of 5 Draft reports. Despite the difficulties inherent in initiating such a large project, and the less than clear and, at times contradictory, guidance and requirements emanating from Mr. Smith's office and staff, a sizeable amount of work was accomplished towards the planned goals for FY 1979.

The Laboratory undertook this project in good faith and conducted its operations towards a 6,000K\$ program on Mr. Smith's personal assurances that the necessary funding would be provided. It appears that Mr. Smith had over-extended his financial resources of 5,000K\$ for FY 1979 (amount stated by Mr. Shewmaker) from the out set of the fiscal year, and the true status of financial resources was revealed only on 2 January 1979, after the Laboratory had made considerable efforts and commitments. The impact on the Laboratory is significant. The layoff has had a deleterious effect on LBL's employee morale. If OEIV had revealed to the Laboratory at the start of the

Dr. Lincoln Moses
Administrator
Office of Energy Information Validation
18 January 1979 ADA 79-25
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fiscal year its true funding status, the Laboratory would have held its efforts and commitments to an annualized rate of 1,000K\$, which is significantly below the rate in the closing months of FY 1978. The plans for broadening the program to a 6,000K\$ level were started in conjunction and with the concurrence of Mr. Smith's office in the early summer of 1978.

The continuation of graduate students beyond 31 January is dependent upon some form of action by your office on the proposal forwarded by Drs. Hyde and Cairns on 12 January 1979, a copy of which is enclosed (Appendix E).

Your cooperation in providing the additional funds of 90 K\$ to LBL's financial plan as expeditiously as possible will be most appreciated. A final cost report will be forwarded to you upon completion of the phaseout. If you should have any questions regarding this matter, please let me know.

Sincerely,



George L. Pappas
Associate Director
for Administration

GLP:jer

Enclosures (Appendices A,B,C,D, and E)

cc: Joe La Grone (w/encs)
Charles Smith (w/encs)

bcc: E. Hyde (w/ encs)
E. Cairns/B. West (w/ encs)
M. Horovitz (w/ encs)

OAK RIDGE NATIONAL LABORATORY

OPERATED BY
UNION CARBIDE CORPORATION
NUCLEAR DIVISION



POST OFFICE BOX X
OAK RIDGE, TENNESSEE 37830

April 3, 1979

Mr. Richard W. Kelley
Chairman
Professional Audit Review Team
441 G Street, N.W.
Washington, D. C. 20548

Dear Mr. Kelley:

Draft Comments on EIA Validation Effort

We have reviewed the section of your draft report on EIA's energy analysis activities that refers to work performed by ORNL under the Form 189 titled "Comprehensive Studies of Selected Data Collection Systems" and we are pleased to offer the following comments:

The draft gives a correct general impression of our role, but it does not describe fully the ORNL EIA project as it has evolved. When the project began, the primary emphasis was on pilot studies of four data collection systems. We and EIA quickly realized that if a high quality job were to be done, we would have to develop and adopt suitable methodologies. We needed to learn how to validate energy data systems. The reports from the four pilot studies were delayed because of this learning process -- and the process is still going on. We believe the delays resulted in significantly higher quality products.

Presently as much of our research is directed at validation methodology as it is at data system studies. The methodological research is in such areas as sampling, data editing, respondent burden assessment, user needs analysis, data requirements for energy model validation, and the development of information processing tools to access oil and gas reserves information. In addition, we and EIA recognize the need to examine not only individual data systems but groups of related systems, such as those concerned with various fuels and with generic portions of fuel supply and use patterns. In this way we expect to identify important redundancies and gaps in the energy information milieu.

Mr. Richard W. Kelley

-2-

April 3, 1979

Other points we suggest you consider include:

1. Paragraph 1, page 1 of Validation Effort of Oak Ridge National Laboratory:

The original funding of \$1.3 million included an obligation of only \$1.0 million in FY 78. The remaining \$0.3 million was applied as carryover into the FY 79 effort.

2. Paragraph 1, page 2 – The second sentence should read:

"The project manager at Oak Ridge indicated that at least 24 professional staff were needed, but only 10 personnel were assigned to the project." In addition, you might add that the number of ORNL staff is expected to increase as methodological research grows. 1/

3. To be more complete, the following should replace part of the last paragraph on page 2:

... "It submitted three draft reports to the Validation Office covering (1) the Capacity of Petroleum Refineries System; (2) the Industrial Energy Efficiency Improvement Program and the Voluntary Business Energy Consumption Program; and (3) the Natural Gas Curtailments System. These drafts were submitted in October and December 1978 and January 1979, respectively. The Validation Office determined that these draft reports formed the basis for acceptable final products. Final reports on these three systems and on three other systems are scheduled for completion between March 1 and September 30, 1979. 2/

4. We should point out that the contract number, W-7405-eng-26, cited in your letter refers to the blanket contract between DOE and Union Carbide for all of the activities done at Oak Ridge. Hence, it is really not correct to refer to this blanket contract number in connection with the EIA validation work since that is only one of many activities carried out under the blanket agreement. It is better to refer to the DOE activity number and the ORNL 189 number under that activity, e.g., DOE activity number FK 02 01 02 for FY-78 and FK 03 01 for FY-79 and ORNL 189 number 00001 under these activity numbers.

PART Note: 1/ Our analysis of the records reveals that 14 personnel were assigned to the project.

PART Note: 2/ The Office of Energy Information Validation, EIA, officials stated that the Natural Gas Curtailments System report submitted in January 1979, was an interim report and did not form a basis for an acceptable final product.

Mr. Richard W. Kelley

-3-

April 3, 1979

We appreciate the opportunity to comment. If you have any questions, please contact Andrew Loeb1 (the ORNL Program Manager) directly. His commercial telephone number is (615) 574-5966 and his FTS number is 624-5966.

Sincerely,



M. W. Rosenthal
Associate Director for
Advanced Energy Systems

MWR:sbw

cc: R. M. Davis
W. Fulkerson
J. A. Lenhard, DOE/ORO
A. S. Loeb1
H. Postma
File - NoRC

VALIDATION STUDIES

<u>SYSTEM AND FORM</u>	<u>CONTRACTOR</u>	<u>FINAL REPORT</u>
1. Joint Petroleum Report System, (FEA-P-320, FEA-P-321, FEA-P-322, FEA-P-323)	Kindle <u>1</u> / Oak Ridge National Laboratory Lawrence Berkeley Laboratory	11/30/79
2. Prime Suppliers Monthly Report, (CIA-25)	Kindle <u>1</u> / Oak Ridge National Laboratory	11/30/79
3. Oil Import System, (ERA-60)	Kindle <u>1</u> / Lawrence Berkeley Laboratory	<u>5</u> /
4. Natural Gas Production System, (Secondary Source)	Kindle <u>1</u> / Lawrence Berkeley Laboratory	<u>6</u> /
5. Crude Oil Production System, (Secondary Source)	Kindle <u>1</u> / Lawrence Berkeley Laboratory	<u>5</u> /
6. Industrial Energy Conservation Program and Voluntary Industrial Energy Conservation Report, (FEA-U-524)	Oak Ridge National Laboratory <u>2</u> /	5/1/79
7. Natural Gas Curtailment System, (EIA-50)	Oak Ridge National Laboratory <u>3</u> /	7/1/79
8. Capacity of Petroleum Refineries, (BOM-6-1334A)	Oak Ridge National Laboratory <u>2</u> /	4/2/79
9. Monthly Power Plant Report, (FPC-4)	Oak Ridge National Laboratory <u>4</u> /	9/30/79
10. Major Fuel Burning Installation Reporting System, (FEA-602)	Lawrence Berkeley Laboratory	<u>7</u> /
11. Monthly Fuel Consumption Report, (EIA-3)	Lawrence Berkeley Laboratory	<u>7</u> /

12.	Middle Distillate Price Monitoring System, (EIA-9)	Lawrence Berkeley Laboratory	<u>8/</u>
13.	Crude Oil First Purchasers System, (FEA-P-124)	Lawrence Berkeley Laboratory	<u>5/</u>
14.	Crude Oil Entitlements Program, (ERA-49)	Lawrence Berkeley Laboratory	<u>5/</u>

-
- 1/ Because of Kindle's performance, its effort is being handed over to the national laboratories. With the completion of Kindle's interim reports, the continuing effort was fully assumed by the indicated laboratory.
- 2/ Oak Ridge National Laboratory has subcontracted much of the effort for these studies to Evaluation Research Corporation.
- 3/ Oak Ridge National Laboratory has subcontracted significant effort for this study to the Institute for Energy Analysis, Oak Ridge Associated Universities.
- 4/ Oak Ridge National Laboratory subcontracted much of this effort to Kindle Corporation. Because of Kindle's performance, Oak Ridge National Laboratory has assumed direct responsibility. Kindle phased out its work and provided a transition document to Oak Ridge National Laboratory on October 10, 1978. Allowing time for proper validation Oak Ridge National Laboratory will submit a draft to the Office of Energy Information Validation not later than May 31, 1979.
- 5/ Incorporated into the Crude Oil Flow Information Study, a requirements study is to be completed in August 1979, after which specific validation studies will be scheduled.
- 6/ To be incorporated into the Natural Gas Information Study, a requirements study now planned in fiscal year 1980, after which specific validation studies will be scheduled.
- 7/ Incorporated into the Fuel Substitutability Study, a requirements study is to be completed in December 1979, after which specific validation studies will be scheduled.
- 8/ To be incorporated into the Market Shares Study, a requirements study is to be completed in fiscal year 1980, after which specific validation studies will be scheduled.

PROFESSIONAL AUDIT REVIEW TEAM
441 G Street N.W.
Washington, D.C. 20548

CHAIRMAN
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GENERAL ACCOUNTING OFFICE

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BUREAU OF THE CENSUS

MR. ROBERT E. LITAN,
COUNCIL OF ECONOMIC ADVISERS

AUG 25 1978

Dr. Lincoln E. Moses
Administrator
Energy Information Administration
1200 Pennsylvania Avenue NW.
Room 4320
Washington, D.C. 20461

Dear Dr. Moses:

While we are aware that you have contracted with Kindle Corporation, Oak Ridge National Laboratory, and Lawrence Berkeley Laboratories to evaluate 14 energy data systems, the Professional Audit Review Team needs to have a clearer picture of the extent to which energy data validation/verification work is underway or planned.

In the Secretary of Energy's November 7, 1977, comments on a draft of our initial report, he stated that a firm commitment had been made to carry out a comprehensive data validation program and that "...One of the first tasks in this area will be to develop a detailed program plan which includes schedules and resources required to ensure the validation of all energy data systems..." We would appreciate it if you would provide us with a copy of your detailed program plan.

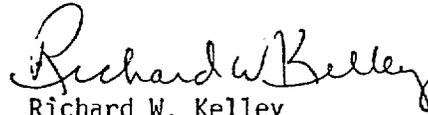
In addition, we are interested in compiling an inventory of relevant specific information on your data systems and the status of your data validation efforts, if one does not already exist. The enclosed list indicates the types of information we desire. They can be categorized as follows:

- a. Identification of the data systems (Items 1 and 7).
- b. Measures of significance or criticality of the data (Items 2, 6, 7, and 8).

- c. Symptomatic indicators of potential data problems (Items 9 and 10).
- d. Status of evaluation (Item 12).
- e. Other background information related to evaluation planning (Items 3, 4, 5, and 11).

We would like to arrange to meet with appropriate staff you may designate to clarify the intent and intended definition of each question. We also envision a pilot review of a few data systems to see what revisions should be made before tackling all 230 data systems. Please call Mr. Harold Nisselson on 763-2562 to arrange for a mutually agreeable time to meet.

Sincerely yours,


Richard W. Kelley
Chairman

Enclosure

bc: PART members
PART staff
Mr. Canfield, EMD
Mr. Peach, EMD

McGee/vlm 8/25/78

SUGGESTED ITEMS OF INFORMATION
FOR INVENTORY OF DATA
SYSTEMS/SURVEYS USED BY DOE
AND EVALUATION ACTIVITIES

1. Name of survey/data system
2. Funding (current FY)
 - Total \$ _____
 - Contractor \$ _____
 - In-house \$ _____
3. Data collecting agency
 - DOE--organizational unit _____
 - Other Federal agency _____
 - Other governmental agency _____
 - Contractor _____
4. Data processing agency
 - DOE--organizational unit _____
 - Other Federal agency _____
 - Other governmental agency _____
 - Contractor _____
5. Frequency of data collection
6. Key data items
7. Statistical products (publication or other)
8. Major users and uses made of statistical products
9. Survey design (e.g., complete coverage, cut-off, fixed panel (non-probability), probability sample, and date of the design or most recent design)

10. a. Number of units in universe, number of units in sample, number of respondents, and, for economic surveys, some measure of the coverage of economic activity represented by the respondents (e.g., production, sales, aggregate consumption)
- b. Percent of key data items imputed, by key item
- All imputation _____%
- For unit non-response _____%
- For item non-response _____%
11. Method of data collection (e.g., administrative records, mail, telephone, personal interview; show combinations, as "personal interview-telephone;" do not include method used for follow-up of non-respondents)
12. Evaluation program(s) (list each separately; do not include quality control programs)
- a. Nature of program (e.g., reinterview, record check, comparison with independent data sources (indicate whether at individual unit or aggregate level), benchmarking)
- b. Funding (per evaluation cycle)
- Total \$ _____
- Contractor \$ _____
- In-house \$ _____
- c. Agency conducting evaluation
- DOE--organizational unit _____
- Other Federal agency _____
- Other governmental agency _____
- Contractor _____
- d. Objective (e.g., measurement of bias, non-sampling variance)
- e. Scope (e.g., coverage, specified data items)
- f. Frequency

- g. Design
 - h. Sample size and number of respondents
 - i. Output products and use made of them
 - j. Comments on adequacy/limitations
13. Notes and comments

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